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The Presidential Address

ON

THE DEBT OF MODERN SURGERY TO THE ANCILLARY SCIENCES*

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[The President began his address with a brief consideration of the remarkable change that had come over surgery as a result of the adoption of Listerism, and showed how "antiseptic" had finally given place to "aseptic" surgery. He, also, gave some personal reminiscences of his connection with surgery at the Manchester Royal Infirmary which dated from 1893.]

AS a sequel to the increased safety engendered by the practice of Listerism there naturally followed the extension of surgery into anatomical fields hitherto approached only when urgent necessity demanded the repair of grave injury. Concerned at first mainly with the limbs and the more readily accessible parts of the trunk, attacks were soon made upon the great cavities of the body—the cranial and spinal cavities, the abdomen, and the chest. Thus the operative field has been gradually extended until now every part of the body has been brought within the sphere of surgical activity. Even the heart—always prominent in popular imagination—is no exception; its stab wounds have been many times successfully sutured, bullets have been extracted from its walls and even from its cavities, and plastic operations have been performed actually upon its valves, while injection of drugs directly into the heart muscle, and massage of the heart through either an abdominal or a thoracic incision have become part of the routine treatment of cardiac failure during anæsthesia. At the present time prominent surgical attention is being paid to the last remaining surgically unfamiliar system—the sympathetic nervous system—and to the last remaining organ—the suprarenal body.†

Of the advances that have occurred in almost every branch of surgical work during the present century (a period almost coincident with that since the last visit of the British Medical Association to this city) I think it will be generally admitted that the most outstanding is that in the department of abdominal, and especially of acute abdominal, surgery. . . . . .

Similar progress, though perhaps less dramatic, has been maintained in the surgery of non-urgent abdominal conditions. [The President here quoted statistics from the Surgical Service of the Manchester Royal Infirmary in support of his statements.—ED.]

Time does not permit me to make more than a passing reference to the present-century advances in other departments of surgical work, though specific mention must be made of the wonderful progress in orthopædic surgery under the stimulating influence of Sir Robert Jones,

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† Opel of Leningrad, in *Annals of Surgery*, June, 1928, reports 130 adrenalectomies for Raynaud's disease, and other forms of "hyperadrenalinæmia."

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of the extraordinary achievements during and since the war in plastic and reconstructive surgery, more especially of the face and jaws, prominently associated in this country with the name of Major Gillies, and of the great increase in our knowledge of the surgical treatment of tuberculosis of the lungs and of other intrathoracic diseases.

This progress in surgery—which, I feel strongly, will compare favourably with that attained in any other branch of the arts and sciences—has not, nor could it have, been achieved without the material assistance of the contemporary advances in the allied sciences; it is, indeed, this which constitutes my main thesis to-night. Modern victories are rarely won single-handed, and the greater the number, the more effective the strength and the more vigorous the activities of the allied forces whence assistance is forthcoming, the more confidently may we look forward to a victorious issue. Prior to the time of John Hunter surgery was almost entirely an art —a glorified handicraft, taught and practised quite independently of all other arts and sciences, devoid of any physiological basis for its methods, and essentially empirical in its attempts at progress. Hunter, deeply imbued with the scientific spirit, introduced into surgery the method of careful observation, collection, and collation of facts, and their thorough testing by direct experimental investigation, rather than that of trusting to theories founded on insufficient and unproved evidence. "Don't think—try" was his favourite exhortation. He it was who first gave allies to surgery, urging that surgery should be regarded as a branch of natural science, to be studied in its appropriate relationship to all the other branches, thus bringing it into close association with chemistry, physics, biology, comparative anatomy, physiology, and pathology. Had the microscope been available in Hunter's day he would doubtless have added to these bacteriology. . . . . .

Though the choice for consideration to-night of a few only of the numerous component factors of this debt of modern surgery to the ancillary sciences must necessarily prove an arbitrary and rather an invidious task, yet I feel that the consensus of surgical opinion will endorse my selection of physics and of physiology as the two sciences to which, in recent times, surgery is most indebted; and further, that of the many useful applications in surgery of the results of researches in physics three have established a special claim upon our attention — x-rays, radium, and light therapy.

RADIOLOGY

The x-rays, discovered by Wilhelm von Röntgen of Würzburg in 1895, were early applied to the diagnosis of pathological states in the human being, and thus was founded the science of radiology, whose subsequent brilliant achievements not only constitute one of the most important chapters of progress in medical affairs during the present century but also open up vistas of still greater possibilities for the future.

The organs and tissues of the body vary in the degree of resistance they offer to the passage of the x-rays, and it is upon the relative opacity of an organ to that of the tissues in its immediate vicinity that the possibility of demonstrating its shadow upon the radiographic plate or screen depends. . . . . .

Foreign bodies are displayable in proportion to their density, those of a metallic nature taking the first place. Had we not had available during the great war the assistance of the x-rays in the detection and accurate localization of the bullets, shell fragments, and other metallic particles lodged in the tissues of so many of our wounded, war surgery would have had a very much less successful tale to unfold. . . . .

The assistance of the x-rays in the diagnosis and treatment of fractures and dislocations has proved invaluable, and the advice given recently by the council of the Medical Defence Union in a circular letter to its members, to insist upon radiography in every case of suspected fracture, would appear to be extremely sound from several points of view other than the intended one of defence against a possible legal action for malpraxis. Radiography soon taught us that in a large proportion of what were formerly considered to be merely "sprains" of joints some definite bony injury was present, the overlooking and consequent failure to apply appropriate treatment to which explains the popular idea that "a sprain is worse than a break." Many incomplete and impacted fractures, and some of those without displacement, cannot be detected by any other means than radiography, and of this the general public is becoming aware. The public is, however, much too prone to estimate

the success or failure of treatment of a fractured bone by the extent of the anatomical deformity displayed in the radiogram, rather than by the functional result; to the popular mind the "setting" of a fractured bone seems to imply that the radiographic picture should show the perfect apposition of the broken surface — an ideal which, though frequently most eloquently stressed by counsel for the plaintiff in an action for malpraxis, is, as the medical profession knows only too well, rarely attainable apart from open surgical operation.

X-ray apparatus is now so efficient that the finest details of structure of the bones are easily shown, and the slightest changes therein induced by early disease can be readily detected. Thus the earliest manifestations of tubercle, of rickets, of syphilis, and of new growths as they affect bone are readily recognizable, and such knowledge conduces to earlier and more effective treatment. One of the commonest applications of radiography of the present day is that to the sockets of the teeth, and many a local source of origin of "focal sepsis," otherwise inexplicable, has been thereby disclosed.

At an early stage of radiography its utility was vastly extended by the introduction of substances opaque to the x-rays into parts of the body otherwise radiolucent, thus rendering them visible. The ramifications of sinuses in the soft parts were demonstrated radiographically by previously injecting them with bismuth paste. The introduction of the bismuth, and, later, of the barium meal has been *the* outstanding advance in radiology, and has completely changed many of our former ideas regarding the anatomical position, the form, and the physiological movements of the different parts of the alimentary tract, while it has added in a truly marvellous degree to our knowledge of their pathology. Radiology, to the infinitely greater safety of the patient, has entirely displaced the bougie in the diagnosis of œsophageal obstruction, and yields an accuracy of information as to the exact situation, extent, and nature of the cause of the obstruction previously quite unattainable. It thus differentiates readily between simple cicatricial stricture, malignant stricture, compression of the œsophagus by tumours from without, and the very imperfectly understood muscular obstruction at its lower end, to which the term "cardiospasm" is applied. The presence, situation, size, and shape of pharyngeal and œsophageal diverticula are demonstrated with certainty by means of the opaque meal, which has also taught us that diverticula of the alimentary canal, though most frequently met with in the pelvic colon, may occur also in the rest of the large intestine, in the appendix, the small intestine, the duodenum, and even in the stomach. The recognition of gastric and duodenal ulcers, of their complications, such as hour-glass contraction and pyloric stenosis; of gastric cancer, more particularly in its earlier stages; of obstructions of the intestines, especially that of carcinoma of the colon, by means of the opaque enema, either alone or in combination with the opaque meal; of displacements of the viscera such as are observed in diaphragmatic hernia or in visceroptosis; and the demonstration by Graham's method of the outline of the gall-bladder some ten to twelve hours after the administration of tetraiodo-phenolphthalein, owing to the power of this viscus to concentrate the bile, in which the drug is excreted, to such a degree as to prove opaque to the x-rays—all these constitute veritable triumphs of radiology, and have enormously facilitated the diagnosis of abdominal conditions.

Much the same may be said of the application of the opaque ureteral bougie and of the introduction of opaque media into some part of the genito-urinary tract during radiography—pyelography, ureterography, cystography, or urethrography, according to the portion of the tract concerned. Of these, pyelography has been most employed, and has disclosed alterations in the size, shape, and position of the renal pelvis, calyces, and ureters which have proved of the highest possible value in the diagnosis of renal pathological states.

The introduction into the trachea of the opaque medium lipiodol—a combination of 40 per cent iodine with oil of poppy seed—renders the bronchi and their ramifications visible upon a radiogram taken very shortly afterwards, and has been found useful in determining the relation of a foreign body in the lung to the nearest accessible bronchus, in demonstrating the outlines of lung abscesses, the presence and extent of bronchiectasis, the existence of a bronchopleural fistula, and the extent of malignant growths involving the bronchi. Lipiodol was originally recommended by Sicard of Paris in

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1921 for the localization of the site of blockage of the subarachnoid space by spinal cord tumours. Introduced into the upper part of this space, as by injection into the cisterna magna, the medium falls by gravity to the level of the upper limit of the obstruction, and can there be radiographically shown. By injecting into the lumbar sac an "ascending" mixture of lipiodol and olive oil, of lighter specific gravity than the cerebro-spinal fluid, the lower extent of the subarachnoid block can be defined. The method is not altogether devoid of danger, and lipiodol, once introduced, appears to remain unabsorbed for a long period, even for years. The injection of lipiodol into the uterine cavity has been used to indicate its size and shape, and any encroachment upon it, as by a growth, while the failure of the medium to pass along one or both Fallopian tubes has been utilized in the diagnosis of their obstruction in cases of sterility.

Another method of altering the relative densities to x-rays of adjacent soft structures, and thus rendering their outlines visible, is the introduction of a gaseous medium—air, oxygen, or carbon dioxide—as into the perirenal tissues, thereby allowing the outline of the renal shadow to be readily discerned; or into the peritoneal cavity, when the liver, spleen, and kidneys are rendered visible. The withdrawal by puncture through a drill hole in the skull of a small amount of fluid from one of the lateral ventricles of the brain and its replacement by air or oxygen has allowed the outlines of the ventricles to be rendered visible upon the radiographic plate; their increased size in internal hydrocephalus can thus be readily demonstrated, whilst the position relative to the ventricle of an otherwise obscure cerebral tumour can often be accurately ascertained. . . . .

RADIUM

Radium was discovered in 1898 by Professor and Madame Curie in a deposit of pitchblende from Joachimstal in Bohemia. Upon both animal and vegetable life radium has a decidedly detrimental effect, which is not, however, exercised equally upon all tissue cells, and even upon normal tissues radium has a decidedly selective action. Thus the cells of glandular structures, especially those of the ovary and testis, are much more susceptible than those of fibrous tissue, while muscle, cartilage, and nerve cells are the least sensitive. Actively dividing cells are the most vulnerable, and the cells of malignant growths, in which activity of cell division is a prominent feature, are more readily affected by radium than the other cells of the body. Upon this selective action the therapeutic value of radium in cancer depends, and our problem is to determine the exact dose that will exert the maximal destructive effect upon the cells of the malignant growth with the minimal upon those of the other tissues. There is a minimal dose below which no destructive action occurs, and many believe that these weak irradiations can stimulate the growth of tumour cells, and even stir into activity cells actually quiescent. The total dosage of radium, calculated in milligram-hours, can be applied either as a large amount of radium acting for a short time, or a small amount acting for a long time, and opinion is not yet decided upon the optimal dosage for each type of growth. On the one hand, by prolonging the duration of exposure, a greater number of cells will be adversely influenced during the vulnerable stage of active cell division; on the other hand, it has been shown experimentally that repeated sublethal doses may actually increase the resistance of the tumour cell to radium, and radiation treatment should, therefore, be concluded within a reasonably short time, and not indefinitely repeated.

As a therapeutic agent radium has been found of considerable value in non-malignant conditions—such as nævus, keloid, lupus and other skin diseases, exophthalmic goitre, and benign tumours—but it is in the treatment of malignant disease (including rodent ulcer) that its chief interest to us lies. Restricted at first entirely to cases too advanced for radical operative treatment, its scope has within the last few years been extended, either alone or in combination with surgery, to the treatment of operable cases. There has arisen a special branch of surgical technique—"the surgery of access"—concerned with the planning of operative procedures for the appropriate exposure of deeply seated malignant growths in order that radium tubes may be placed in correct relation thereto—as when a rectal carcinoma is exposed by removal of the coccyx and lower portion of the sacrum, an œsophageal carcinoma through the posterior mediastinum

after rib resection or across the pleural cavity by lateral thoracotomy, or an intralaryngeal growth through a "window" cut in the thyroid cartilage. Modern methods of radium application have met with such considerable success in cancers of the skin, of the cervix uteri, of the mouth and tongue, and of the larynx, that there is an increasing tendency in these cases to prefer radium to operative treatment, at any rate so far as the primary growth is concerned. The comparatively slight disturbance of radium tube insertion, or of radium bomb treatment, their lesser risks, and the absence of that mutilation necessarily associated with a radical surgical operation, and which, as in the case of the tongue may prove a considerable and permanent disadvantage, are factors favourable to radium, and should tend to overcome the natural reluctance of the average patient to submit to early treatment. It is, however, upon the end-results that the question must be ultimately decided, and these are not yet sufficiently known in the case of radium for a conclusive judgment, although some promising series of five-year statistics have been reported. In many cases the best results are obtained by a combination of radium treatment with surgery, as when the radical operation for cancer of the breast is associated with the implantation of radium tubes or needles into the supraclavicular and anterior mediastinal regions. At the present moment expert opinion seems to favour reversion to the external application of radium, either alone or in combination with radium tube insertion and very short wave-length x-ray irradiation. There are, however, two most important changes from the surface applications as originally practised: (1) the much larger quantities of radium used—up to 4 grams, and (2) the much greater distance from the skin—as much as 16 cm.—at which it is applied, thereby ensuring a more uniform dosage to all parts of the area irradiated, with lessened risk of cutaneous damage. This "bomb" or "cannon" treatment—as at present carried out in Paris, Brussels, Stockholm, and on a smaller scale at the Westminster Hospital, London—is considered by many likely to prove the method of choice in radium therapy, and it certainly deserves to be tested very thoroughly, should a sufficiency of radium be forthcoming . . . The technique of radium therapy is highly specialized, and such work should be centralized, and restricted to the expert staffs of special institutions established in a few of the largest cities of a country.

ACTINOTHERAPY

Heliotherapy—treatment by sunlight—is probably as old as human history. Hippocrates (460 to 370 B.C.) refers to the effect of sunlight in promoting health, and recommends sufferers from various ailments to walk about naked in the sun as much as possible—a simple remedy, which seems, however, to have been overlooked for many subsequent centuries.

At the end of the last century a considerable proportion of the beds in the hospital wards of our large cities was occupied with cases of tuberculous disease of the bones, joints, and spine, and other forms of "surgical" tuberculosis, for which operations, often of a very extensive and mutilating nature, and frequently requiring repetition, were considered the only chance of a cure. How frequently they failed, and, even when successful in saving life, the unsightly deformities and fearful defects of function that resulted are some of the unpleasant memories of those of us who practised at that time. No more beneficient change has occurred in any department of treatment than in that of surgical tuberculosis during the past quarter of a century.

Thanks to the pioneer work of Bernhard and Rollier in Switzerland, and of Sir Henry Gauvain and Sir Robert Jones in this country, these mutilating surgical operations are things of the past. Surgical tuberculosis is nowadays treated by a general exposure of the body to sunlight in the open air in summer, and to artificial sunlight in the winter or whenever natural sunlight is not available. This should be combined with local treatment so designed as to ensure complete immobilization of any active focus, the removal of any pressure or weight-bearing, the correction, so far as is possible, of any existing deformity, and the antiseptic care of any discharging sinuses. Active surgery is limited almost entirely to the evacuation of any cold abscesses that may develop, although in tuberculous spinal disease operations (Albee's, Hibb's) are occasionally performed, not as a direct attack upon the affected tissues, but to ensure better immobilization of the morbid focus

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in the vertebral bodies by producing ankylosis of the spinous processes of the diseased vertebræ and of those immediately above and below. Under this modern plan of campaign not only is victory assured in a much greater proportion of cases, but the bronzed and robust-looking bodies of the patients under sunlight treatment contrast pleasurably with the waxen faces and wasted limbs of the old days, while the local focus of disease heals with the minimum of deformity and the maximum preservation of function.

Treatment by ultra-violet radiation (actinotherapy) is now being extended to rickets and other general diseases, to most forms of skin disease, and to many disorders of the circulatory, respiratory, alimentary, nervous, and genito-urinary systems, as well as to those of the special senses. It has, in fact, assumed the dimensions of a "boom" treatment, and "sun-ray" centres are being established all over the country, not only as private ventures, often controlled by laymen only, but also at the municipal bathing establishments of many of our cities and towns, while there are sunbaths in many factories and at "pitheads" in several of our coal-mining districts.

The ultra-violet rays are, however, far from being innocuous, and their correct dosage is a matter of great importance and of careful individualization, since what is a safe dose for one may be dangerous to another. Over-exposure to their influence produces sleeplessness, restlessness, loss of weight, lassitude, and even sickness, while severe burns and serious forms of dermatitis may result in sensitive persons. Moreover, some ailments are adversely influenced by ultra-violet ray treatment—notably chronic nephritis, arterio-sclerosis, and quiescent tuberculosis, the last of which may easily be stirred into renewed activity. It is therefore in the public interest that the prescription of ultra-violet rays be restricted to the medical profession, and that their application be undertaken only by those who have received a proper course of training for this special work.

The unqualified, unregistered chemist, dentist, and midwife are forbidden by law, and it seems only logical that the unqualified electrotherapist, who handles therapeutic measures equally potential of danger, should be placed under similar legal control.

PHYSIOLOGY

Physiology has often been referred to in the past as the handmaiden of medicine, but such a description very inadequately represents its present status as a proud and independent branch of true science—the science of life itself. Rather must it be described as the essential foundation of modern medicine and surgery, as the means by which many of our former purely empirical methods of treatment have been placed upon a rational basis, and as the main factor by which the practice of medicine and surgery is daily becoming proportionately more of a science and less of an art. That the element of art must continue permanently to play a considerable part in surgery is self-evident when we remember how largely handicraft enters into its daily routine, but the merely artistic aspect of surgery has now, we may fairly claim, been brought to so high a degree of perfection that it is not so much upon outstanding advancements in surgical artistry that we must rely for future progress as upon a more thorough understanding of the physiological principles involved in our work, and their application to what is, after all, the great aim of surgery—the restoration of deranged function to the normal. The greater comprehension the surgeon obtains of what constitutes normal function the better equipped is he to achieve this aim, and to improve his methods by means which were not possible in the days when physiology was less advanced. The surgeon and the physiologist must tread the path of progress hand-in-hand, to the great advantage of each, since the debt between them is essentially a mutual one. For the success of his experiments upon animals the physiologist has to depend largely upon the methods of modern aseptic surgery, and has, therefore, a very vital interest in any improvements in surgical technique that may from time to time accrue. Moreover, though it is true that many discoveries made by physiologists which have found valuable practical application in medicine and surgery have originated purely in the search after truth and without any thought of their possible clinical utility, yet, on the other hand, there are many instances where clinical observation has been the starting-point of physiological researches which have ultimately proved of the greatest benefit in the treatment of human disease. One of the most impressive illustrations

of this is yielded by the development of our knowledge of the localization of function in the cortex of the brain. . . . .

The progress of physiology during the present century has been characterized by many new methods of study, by the greater attention devoted to human physiology, and by the enormous strides made in the physiology of nutrition. If we look back to the beginning of this century and compare the state of physiological knowledge then with that of the present day it is wonderful to contemplate the discoveries that have been made. The use of x-rays for the examination of the function of the stomach and small intestines, developed first of all by Cannon for physiological purposes, had only just begun to be applied to the diagnosis of alimentary diseases. The rôle of proteins in nutrition was imperfectly understood and their chemical constitution was only a conjecture. Vitamins had not been heard of. Insulin was still a hypothetical substance. None of the active principles of the ductless glands had been synthesized and their mode of action was very incompletely known. Micro-methods for the biochemical examination of the blood and other body fluids were practically unknown. The buffering mechanisms of the blood were not dreamt of, and the close interplay between normal physiological functions such as secretion and respiration, and their part in the regulation of body neutrality, was not known. The relation of the capillary circulation to the production of shock is also a relatively recent discovery.

All these advances in knowledge, and many others that might be mentioned, have had their influence on surgery — directly, because they have improved methods of diagnosis and treatment, and indirectly on account of their influence on the attitude of the surgeon to his subject. It is impossible to deal in detail with each particular advancement which surgery owes to physiology, but a few examples may be mentioned.

RICKETS

This disease, responsible for a large number of the deformities with which surgeons have been called upon to deal, may be expected to disappear within the next decade, as a result of the discoveries which have been made on the influence of vitamins, and especially vitamin D, on nutrition. It is a matter of congratulation that the pioneer work of Hopkins on the discovery of vitamins, and of Mellanby on the dietetic factors which influence the development of rickets in dogs, was done in this country. The direct production of vitamin D is certainly the most important advance yet made in the chemistry of the vitamins, and has not only paved the way to a rational therapy of rickets, but, better still, has pointed out methods of prevention that should lead to its disappearance. Not only has this new treatment of rickets—the administration of concentrated vitamin D—an apparent advantage in point of time, but its great convenience, its exactness of dosage, and its economy are all in its favour. Before its adoption on an extensive scale, however, much requires to be known as to the stability of the new preparations, their keeping properties under various conditions, the exact dosage required for the cure of human rickets, and the possible dangers of excessive dosage. . . . . [At this point the President dealt with the important subject of blood-transfusion.—ED.]

INSULIN

Although the isolation of insulin and its preparation in a suitable form, standardized for therapeutic use, is a triumph of physiology which finds its greatest use to the physician in the treatment of diabetes, yet it has not been without its value to the surgeon. Diabetic patients require surgical attention proportionately much more frequently than non-diabetics, or than sufferers from other chronic diseases. Thus Fitz found that 14 per cent of 386 diabetics consecutively treated at the Massachusetts General Hospital required surgical intervention, chiefly on account of the frequent occurrence of carbuncle and of gangrene. Prior to the introduction of insulin a high mortality attended surgical operations in diabetes, mainly owing to slow healing of the tissues, to their increased liability to infection, and to the frequent development of post-operative coma; insulin administration, together with precision in diet, has so completely transformed the surgical outlook that, as reported from the Mayo Clinic in 1926, no patient is now refused any necessary operation because of diabetes, and the mortality of operations upon diabetes has been reduced to that in cases without this complication. It seems likely that in the future, with a better knowledge of the

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part played by insulin in carbohydrate metabolism, it may find other uses. Its value in furthering the deposition of glycogen has already been applied to the improvement of the functional activity of the liver, and in cases of inanition which have to be operated upon it may be of value in rapidly inducing a better nutritive condition of body tissues; while the combination of glucose intravenously with insulin subcutaneously has proved of considerable value in the treatment of shock, creating an immediate supply of energy from the rapid oxidation of the glucose by insulin.

ASSESSMENT OF RENAL FUNCTION

It is principally to the painstaking and persevering work of the American biochemist Folin that we owe the modern micro-methods of blood analysis whereby, using only a few cubic centimetres of blood, all the important constituents can be accurately determined. These methods have been particularly helpful in cases where prostatectomy is contemplated and where it is essential to know to what extent the excretory functions of the kidneys have been already adversely affected by back-pressure from the prostatic obstruction, as indicated by the abnormal retention in the blood of urea, uric acid, creatinin, and other waste products to an extent varying directly with the degree of renal derangement. It cannot, in fact, be too strongly stressed that the operative risks of prostatectomy are concerned infinitely more with the condition of the kidneys than of the prostate, and that by delaying the major operation until the renal functions have been improved by the relief from "back-pressure" afforded by adequate preliminary drainage of the bladder—either by the indwelling catheter or by suprapubic cystostomy—the dangers attending the removal of the prostate can be very materially diminished. Biochemists, by means of their tests of renal functional capacity, have enabled surgeons to estimate the power of the kidneys to withstand surgical intervention with a degree of accuracy that is truly remarkable.

Of other methods of applied physiology to which the surgeon is indebted, mention may be made of the use of fractional gastric analysis for investigation of the activity, both digestive and motor, of the stomach; the duodenal tube for the collection and examination of bile; estimation of the basal metabolism as a guide to over- and under-activity of the thyroid and pituitary glands, and to the nature of the operative procedures to be undertaken in connection therewith; determination of the carbon dioxide combining power of the blood and its relation to the diagnosis of those conditions of acidosis and alkalosis that occasionally complicate surgical procedures; and the examination of the red blood corpuscles for "fragility" in cases of splenic enlargement, as in hæmolytic jaundice. Pregnant with promise, too, is the recent extension of physiological research to the whole field of human activity.

BACTERIOLOGY

Of modern surgery's debt to the other ancillary sciences that to bacteriology is assuredly the most fundamental, since it was Pasteur's discovery that fermentation and putrefaction were caused by minute living organisms and were, therefore, vital and not merely chemical processes, as hitherto believed, that led Lister to his great conception of the antiseptic treatment of that putrefaction then found in almost all wounds—a conception which constitutes, as we have seen, the very starting point of modern surgery. Time permits me merely to mention other advances in bacteriology: the detection of the causative germs of almost all the infective diseases; the enunciation of the great principles of immunity, both "active" and "passive"; the preparation of vaccines and of antitoxic serums and their use in the prevention and treatment of bacterial infections; the therapy of systemic infections by the intravenous introduction of chemical antiseptics resulting, among other notable gains, in that brilliant conquest of the former scourge of syphilis that has been achieved within the present century—all of which constitute mile-stones along the highway of bacteriology's triumphal progress.

Nor have I time to refer to the great help that modern surgery has received from research workers in anatomy, pathology, and pharmacology, valuable as their contributions have been; nor yet to more general sources of assistance such as the greatly improved means of rapid intercommunication—the telephone, the wire-

less—and of rapid transport—the motor-car, the aeroplane—factors which have so materially facilitated the prompt application of surgical relief in cases of emergency, whether on land or at sea.

I trust, however, that enough has been said to indicate that modern surgery, with the aid of its allies, has made and is still making great progress towards that end we all so fervently desire—the prevention of those abnormal conditions, the late results of which to-day necessitate so much surgical attention of a destructive rather than a constructive character. Much yet remains to be done, and the natural sciences must continue to advance, each ready to assist and to accept assistance from its fellows, each along its own special path yet all in mutual friendly alliance working for the common good, all in zealous pursuit of that goal, unattainable though it must ever remain, that will-o'-the-wisp of perfect knowledge and complete understanding. In so doing they will but follow the precept and the spirit of that motto upon the crest of our beloved University, in whose venerable precincts this great Association will to-morrow enter upon its full scientific program, and of which we in this city are all so intensely proud; "Arduus ad solem"—"leaping upwards to the sunshine"—"ever striving towards the very highest."

An Address

ON

THE MECHANISM OF THE DIURESIS PRODUCED BY INGESTION OF WATER*

BY L. AMBARD, M.D., AND F. SCHMID, M.D.,

Strasbourg, France

IT is generally recognized that diuresis may result from a variety of conditions. This communication is concerned with the results of an investigation of the polyuric response to the injection of water. It is a well recognized fact that, in animal or man, when large quantities of water are ingested, polyuria rapidly results, particularly if the stomach be empty at the time of the experiment. The intensity of this form of diuresis may be such that, within an hour and a half, practically all of the ingested water may be eliminated.

Various explanations of this phenomenon have been offered. In 1912, Grinsberg† suggested that this diuresis could not be explained simply by the reaction of the body tissues to the addition of excess quantities of water. This view was supported by the observation that, though water when introduced into the alimentary canal leads to polyuria, the same quantity of water when administered subcutaneously or intravenously results not in polyuria but in oliguria. In view of these findings, Grinsberg concluded that the ingestion of water leads to the liberation of some hormone from the intestinal mucosa and that this hormone has diuretic properties.

At the time Grinsberg offered the above mentioned hypothesis, an obvious difficulty which had to be overcome before accepting it was that water, when introduced into the alimentary tract, not only has to pass through the intestinal mucosa before its distribution throughout the body tissues but that it is also exposed to the action of the liver. Therefore, the possibility that the liver may be responsible for the resultant polyuria had to be considered. However, from the work of Pick and Molitor, in an entirely unrelated problem, the difficulty was somewhat simplified. These authors observed that, in dogs with Eck fistulæ, polyuria may follow the oral administration of water, and that this polyuria may not only be of the same degree as in normal animals but, at times, much more intense.

Repeated attempts have been made to verify the hypothesis put forward by Grinsberg. In

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† *Arch. f. exp. Path. u. Pharm.* **69**: 1912.

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1912, Cowe prepared extracts from the intestinal mucosæ of dogs according to the technique then in use for the preparation of secretin. The material of the mucosa was macerated and the mass was acidified and heated for several minutes. After allowing the mixture thus obtained to cool, it was filtered and the filtrate was slightly neutralized. This neutralized filtrate, when injected subcutaneously into dogs, produced diuresis. That the polyuria thus obtained was not due to the diuretic action of the mineral content of the extract, was proved by the fact that when the extract was ashed and the ash was injected with a similar quantity of water, polyuria did not take place.

An attempt was then made to determine the site of action of this extract. When the kidneys were perfused with it directly, no diuretic action was obtained. When, however, the extract was allowed first to pass through the circulation of the head of the animal, polyuria resulted. Because of this observation, Cowe concluded that this form of diuresis was due to the liberation of a hormone from the tissue of the head of the animal and suggested pituitrin as the responsible agent. It may here be observed that, at that time, it was not known that the action of pituitrin was anti-diuretic.

In 1914, Hashimoto attempted to repeat Cowe's experiments, using the same technique as the English author. Hashimoto's results were diametrically opposite to those reported. Hashimoto noticed that a solution of the ash of the intestinal extract had as much diuretic action as the extract itself. He, therefore, concluded that an intestinal hormone with diuretic properties does not exist and that the theory put forward by Grinsberg had to be abandoned. Though Cowe did elaborate the theory it was by reason of an erroneous premise. Verney's observations (1925) were not then known. It was not known that pituitrin has no diuretic properties. In addition to this, we now know that the experimental results of Cowe were not due to the liberation of pituitrin.

In spite of the general confusion of experimental data, and with very little sound support for theory, we are left with the incontestable fact that polyuria results from the ingestion of water and that similar amounts of water administered subcutaneously or intravenously do not have the same effect. This phenomenon must be explained and it is the results of a study of it that form the subject matter of this paper.

In our work we made use of a technique radically different from that of Cowe. This technique eliminated the necessity of the control experiment, which consisted of injections of watery solutions of the ash of the extract, the results of which led to disagreement between Cowe and Hashimoto. Our extract was prepared as follows:—

The material to be used was obtained from the mucosa of the first half of the intestinal canal of the cow. It was finely macerated and to it was added 40 c.c. of a decinormal solution of sulphuric acid and one litre of acetone for each kilogram of material. The mixture thus obtained was heated in a crucible for two hours at 79° C., cooled, and to the cooled mixture an amount of acetone was added corresponding to nine litres per kilogram of mucosa. With this technique, one obtains an abundant precipitate, and the final yield of material, obtained by subsequent fractional precipitation, is also abundant.

The basis of fractional precipitation is that extracts of organs contain different albumins, which may be separated by altering the p^H of the extract or its concentrations of alcohol and acetone. The precipitate first obtained is dissolved in an amount of water corresponding to 60 c.c. per kilogram of mucosa. The solution is slightly neutralized, the volume is noted, and to it are then added four volumes of acetone. The precipitate thus obtained is discarded. When an additional five volumes of acetone are added to the remaining material a new, though less abundant, precipitate is obtained. The residual acetone solution contains some substances in solution which can also be precipitated by neutralizing the remaining solution. This precipitate is viscous and maroon coloured. This portion of the extract is, however, not made use of.

According to the above mentioned technique, it is possible to obtain 0.3 or 0.4 grams of precipitate per kilogram of original material. By a second precipitation, however, conducted in a similar manner for purposes of purification, the final yield is only about 0.15 to 0.20 grams, and it is this purified substance which was used in our experiments.

The experimental animals were rabbits each weighing approximately three kilograms. During the experimental periods the animals were kept under the influence of either urethane (15 per cent solution in distilled water) or of chloralose (7 per cent solution in NaCl). The urines were collected by ureteral catheterization. The catheters were joined together by a horizontally placed glass tube of small bore. The urine volume output was expressed in terms of millimetres of urine obtained. The quantity of extract injected in each case depended upon the body weight of the subject, a definite amount being given per kilogram of body weight. Though the amounts of the extract varied with different subjects, in each case the total quantity used was dissolved in 1 c.c. of water. Injections were made, in the case of rabbits, in the vein of the ear.

EXPERIMENTAL RESULTS

Eleven experiments were performed upon rabbits and two upon men. In the first experiment, the injection of fourteen milligrams of the extract resulted in death of the animal in a few minutes. In a second experiment, the injection of six milligrams led to suppression of urine for such a length of time that the experiment had to be abandoned. In six other instances, two and one-half milligrams of the extract were used and in each case diuresis was noted. The diuresis made its appearance about two or three minutes after the injection. At the height of the polyuria, the urine volume output was as much as three or four times that noticed during the control period. In each case it was noted, however, that prior to the onset of polyuria there was a period of anuria of two or three minutes' duration. In two experiments, the injection of one milligram of the extract was followed by immediate polyuria of about ten minutes' duration. In the last experiment, the injection of one-fifth of a milligram of extract resulted in an immediate polyuria of five minutes' duration.

In man the extract was administered by the mouth. In the two experiments, the amounts given were one-half and one milligram per kilogram of body weight respectively, and they were dissolved in 10 to 20 c.c. of water respectively. No polyuria was noted.

Control experiments with extracts obtained from spleen and kidney were made. There was no diuresis.

The accompanying protocols of three typical experiments will give a fair idea in more detail, of the results we obtained.

EXPERIMENTAL DATA

Exp. A. Rabbit, weighing 3.2 kgm. Injection of 2.5 mgm. extract. Urine collected at five minute intervals.

Time	*Height of column of urine in millimetres*
5.20 p.m.	46
5.25 "	37
5.30 "	34
5.35 "	39
(Injection of extract at 5.36 p.m.)	
5.40 "	10
5.45 "	128
5.50 "	183
5.55 "	114
6.00 "	72
6.05 "	
6.10 "	50
6.15 "	36

Exp. B. Rabbit weighting 3.3 kgm. Two injections of intestine, each of one milligram, and an intervening injection of one milligram of spleen.

Time	*Height of column of urine in millimetres*
5.55 p.m.	55
6.00 "	50
6.05 "	37
(Injection of intestine at 6 p.m.)	
6.10 "	258
6.15 "	202
6.20 "	110
6.25 "	40
(Injection of spleen at 6.26 p.m.)	
6.30 "	30
6.35 "	24
(Injection of intestine at 6.37 p.m.)	
6.40 "	271
6.45 "	276
6.50 "	45

Exp. C. Rabbit weighing 3.2 kgm. Injection of 0.2 mgm. of intestine and a control injection of 1 mgm. of kidney.

Time	*Height of column of urine in millimetres*
6.25 p.m.	85
6.30 "	51
(Injection of kidney at 6.31 p.m.)	
6.35 "	36
6.40 "	46
(Injection of intestine at 6.41 p.m.)	
6.45 "	132
6.50 "	40

DISCUSSION OF RESULTS WE OBTAINED

If we set aside the experimental results obtained in man when the extract was administered orally, the remaining data lead to the conclusion that: (a) large amounts of this extract prepared from intestinal mucosa lead to anuria and even to death; (b) that lesser

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quantities lead to diuresis preceded by oliguria; and (c) that very minute doses lead to polyuria only.

Since it is generally recognized that blood pressure is intimately concerned with renal secretion, our data obtained with regard to this phase of the subject are of interest. With the injection of one milligram of the extract there was noted a fall of blood pressure corresponding to about 30 mm. of mercury. The fall of blood pressure was transient. At the end of one minute it returned to its original level. With doses of three milligrams the fall of blood pressure was not any greater, but it was more persistent.

From the above observations it appears that the extract which we obtained by our technique was not a pure substance. It appears to contain a mixture of substances, some of which are responsible for anuria and shock. When large amounts of the extract are administered it would appear that the substances responsible for anuria and shock are present in such amounts as to counteract the action of the diuretic. The diuretic appears to be specific. We now know that the polyuria cannot be attributed to the ingested water itself, nor can it be attributed to the ash content of the extract. Controlled experiments with spleen and kidney tissue did not result in diuresis.

One cannot close this report without some speculation as to the possible underlying mechanism of this form of diuresis. If one were to accept the view that suppression of pituitrin secretion leads to polyuria, it might be suggested that diuresis following oral administration of water results from an inhibiting action of some hormone which originates in the intestinal tract and which counteracts the action of pituitrin. We believe that this hypothesis must be rejected, since the suppression of secretion of pituitrin is relatively a slow action, whereas the onset of the polyuria resulting from the injection of the intestinal extract occurs rapidly, namely, within about twenty seconds. In view of this observation, and also of the fact that the extract causes a fall, rather than a rise, of blood pressure, it is suggested that the action of this extract is directly upon the kidney cells.

In view of the above observations, our conclusion is that when water is administered by mouth it leads during its absorption into the body to the liberation of a hormone from the intestinal mucosa. This hormone is a diuretic and it produces polyuria by acting directly upon the kidney cells.

One can hardly close this discussion without some speculation. These findings appear to have some practical significance. In the usual water tests which we use for the estimation of renal efficiency we assume when an individual is given a large volume of water and no polyuria or a lessened polyuria results that this is due to impaired renal efficiency. May it, therefore, not be that in an individual with a nephritis there is some disturbance of the metabolism of the gastro-intestinal tract, and that this, and not impaired renal efficiency, is responsible for the absence of the polyuric response? In other words, here, again, we have a suggestion that in nephritis we are not dealing with a condition in which one organ only is disturbed, but with a general metabolic disturbance having a local manifestation in the kidneys.

PREGNANCY FOLLOWING AMPUTATION OF BOTH BREASTS.—Contrary to the view that there is some functional association between the breasts and the female genital organs, Leunckens and Pastiels report a case indicating that the mammary glands apparently exert no influence on the utero-ovarian apparatus. A woman, aged 37, had phlegmonous inflammation of both breasts soon after her confinement; all varieties of local and general treatment were ineffective. The blood culture showed a staphylococcal infection. The breasts continued to inflame and suppurate, and amputation of the right breast was therefore undertaken to save the patient's life. The general condition improved, and the left breast was accordingly removed. Recovery was uncomplicated. The physiological results of the operation were awaited with interest. Menstruation was not affected in rhythm, duration, or regularity; the patient noticed faint prickings in the operation scars at the beginning of the menses. The genital feelings were unaltered. Eight months later the patient became pregnant and went to term without any noteworthy event. The accouchement was uncomplicated and the infant survived. The puerperium and the involution of the uterus were quite normal. Two later pregnancies occurred, but neither of these went to term. The authors, however, do not consider that the operation could have affected these remote events.—*Brit. M. J.* **2**: 9, July 13, 1929.

BETTER RESULTS IN ACUTE INTESTINAL OBSTRUCTION DUE TO RECENT METHODS OF INVESTIGATION AND TREATMENT*

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THE prodigious amount of research work done in recent years on intestinal obstruction has resulted in a better understanding of the underlying problems connected with it, particularly in regard to the altered chemistry. As a consequence of this, as soon as the physician considers intestinal obstruction a possibility he should institute treatment for the relief of chloride deficiency. There is still, however, a very high mortality rate, due partly to the delay in calling a surgeon, estimated to occur in one-fifth of the cases, for which the family physician is not necessarily to blame, as he is frequently called late. Even though the surgeon knows in advance that these cases have not more than a 2 per cent chance of recovery he does not refuse to operate, as without it there would be 100 per cent death rate.

In this disease we are dealing with mechanical obstruction on the one hand, and damage to the bowel wall with the production of a toxin on the other, together with dehydration and its accompanying disturbance. It will, therefore, be readily seen that the longer the condition is allowed to persist the greater will be the damage to the bowel wall, and the more deranged the metabolic processes, so that a time must arrive when it is too late to expect anything from operation; for although the obstruction may be relieved, the production of toxic substances, and the damage to the bowel wall, may be so great as to prevent recovery. Much work has been done in an effort to discover the nature of this toxin, but up to the present it has not been demonstrated. Everyone agrees that it is not present in the normal intestine, that it has its origin above the point of obstruction, and is probably caused by the disintegration of protein. Williams[1] suggests that the toxin is formed by the *B. Welchii*, but this has not been proven, nor has the toxin been shown to be due to any other organism. Whipple[2] thinks that a poison, which he believes to be a proteose, emanates from the intestinal mucosa when this is injured, but that it differs from it in that animals cannot be immunized against it. The experimental work of Wangensteen and Loucks[3] showed that these toxic substances have an effect upon the body similar to that produced by histamine, one of the outstanding features of which is a great fall in the arterial blood pressure. Based on this fact numerous observers have experimented with histamine, but the results are not conclusive.

SYMPTOMS AND SIGNS

It is not the purpose of this paper to discuss all the clinical aspects of obstruction, but we may state briefly that the essential symptoms are: (1) vomiting; (2) pain of a colicky character; (3) stoppage of the bowels.

We should like here to utter a word of caution against the practice, all too prevalent, of giving frequent exhausting enemas of assorted varieties before calling a surgeon. In the early stage of an obstruction there will not be distension, and it should be possible to diagnose the condition before the distension becomes marked. Obstruction should be easily distinguished from perforation or an inflammatory lesion by the fact that in obstruction the abdominal wall will be soft, whereas in the latter there will be rigidity. A diagnosis of intestinal obstruction should always be made without the help of the laboratory. The latter

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will later be of assistance in showing the damage done. An x-ray is not necessary and should never be employed as an aid to diagnosis, as the delay entailed in obtaining one may prove disastrous to the patient.

The urine is always scanty, contains a slight trace of albumin, has a large increase in the non-protein nitrogen, a decrease in the chloride content, and often traces of phenol and indican. The changes in the blood are definite and easily determined. First, the chlorides are reduced; second, there is a rise in the non-protein nitrogen; and third, the carbon dioxide combining power is increased.

The laboratory can determine accurately the chloride content, the non-protein nitrogen content, and the carbon dioxide combining power of the blood. The amount of chlorides in the normal blood is fairly constant at 0.6 per cent. In cases of obstruction it will fall to half of this, or less. The chlorides are absolutely essential to life, every fluid in the body containing varying amounts, therefore the reduction of the amount in the blood seriously disturbs the equilibrium of the body's metabolism.

The non-protein nitrogen can be easily estimated in any laboratory and is due almost entirely to the increase in blood urea. We believe that this is distinctly helpful in enabling us to make a prognosis, and when excessively high we look for a fatal termination.

The term "alkalosis" is a relatively new one, the condition depends upon a disturbance of the acid forming radicals in the blood. These radicals consist largely of chlorine, bicarbonates, acid phosphates, and, to a lesser extent, sulphates. Chlorine is thought to make up 50 per cent of the total. One can easily see, therefore, that the loss of a large amount of chlorides will help to bring about this condition. The symptoms of alkalosis in animals are hyper-excitability and tremor. We are able to determine the amount of alkalosis by an estimation of the carbon dioxide combining power of the blood.

CAUSE OF DEATH

The fundamental cause of death is not known. Numerous theories have been put forward by a great number of workers. Although a toxæmia is present in these cases it has never been proven to be the cause of death. A plausible theory is that advanced by Gamble and McIver,[4] who consider that the water loss, with the accompanying loss of electrolytes, chlorides, phosphates and carbonates, is the prime factor. Gatch[5] supports this view. Hartwell and Hoguet[6] believe that death is due to dehydration only, to which view Wilkie[7] subscribes. When one considers that the small intestines secrete seven to nine litres of fluid in twenty-four hours one realizes the seriousness of dehydration. Hausler and Foster[8] give the cause as starvation.

TREATMENT

Let us see how the knowledge gained by laboratory examination can be used to treat the patient.

First of all, for the relief of hypochloræmia we can, obviously, administer salt. This can be administered either interstitially or by the continuous intravenous method, using normal salt solution, either with or without glucose. The use of continuous intravenous saline was first suggested and carried out by Dr. R. Matas,[9] and has been successfully employed by Drs. Gallie and Harris[10] at the Sick Children's Hospital, Toronto, for some years, the latter having devised a very simple apparatus which we have found most useful. For the relief of starvation, glucose solution given as described is our "sheet anchor." We have frequently been able to sustain patients by this method for periods of a week or two.

The treatment above indicated for hypochloræmia and starvation will also relieve the dehydration. If the fluid is given interstitially it is necessary to allow a small amount to run in steadily, rather than large amounts interruptedly, as the latter procedure is very painful to the patient. We have given interstitial solutions for many days at a time without producing sloughing or much discomfort.

We have found the administration of salt, glucose solution, or even water, into the distal end of an ileostomy to be useless, and agree with Haden and Orr,[11] Gatsch, Trusler and Ayers[12] that it probably shortens life. There is no doubt that the administration of water *per rectum* is of value. In children repeated transfusions are sometimes beneficial.

No therapeutic measure has been found to combat the increase in the urea nitrogen.

Nevertheless, the increased fluid administration, by stimulating the kidneys and the sweat glands, provides nature with a method of elimination. In cases of high obstruction, as there is always a good deal of regurgitation of the duodenal contents into the stomach, we drain the latter by means of an Einhorn tube. This may be left *in situ*, even in a child, for many days, and keeps the patient much more comfortable, as it permits of water being drunk freely; at a later stage the tube may be used for the administration of purgatives and nourishment directly into the duodenum.

In cases in which paresis of the bowel already exists, we have had good results from the use of an intravenous injection of 30 c.c. of a 30 per cent solution of sodium chloride. In spite of much objection to this measure, we have obtained such rapid and positive results that we shall continue to employ it.

A great many drugs have been recommended as adjuncts in the treatment of obstruction. With the exception of heart stimulants our field has narrowed down to two, *viz.*, pituitary extract and physostigmine. The action of pituitary extract is on the smooth muscle fibres of the intestinal tract, whereas physostigmine stimulates the vagus nerve, and through it the muscle and secreting cells of the mucosa. We have been employing these drugs in combination for some years, as recommended by Dixon in the *British Medical Journal*. We have had no result from the hypodermic use of any of the purgative glucosides. Brockman[13] suggested repeated injection of bile into the rectum but we have not tried it.

OPERATIVE TREATMENT

A patient suffering from intestinal obstruction is never a good risk, therefore the least amount of surgery which will suffice should be done.

1. *Jejunostomy and Ileostomy.*—For drainage of the loop above the obstruction these procedures have in many quarters fallen into disrepute, perhaps, largely, because they were not done until the patient was nearly moribund. Jejunostomy is practised at the Mayo Clinic in high obstructions, and, we understand, with considerable success. We have had several cases whose recovery was undoubtedly due to jejunostomy. Very high obstructions of the jejunum can be emptied by squeezing the contents back into the stomach and washing out the stomach, and in these cases the duodenal tube will be found of great advantage, as it enables one to drain the upper jejunum through the stomach.

Sir Frederick Treves, who wrote one of the best monographs that has ever been published on intestinal obstruction, states that after the obstruction has been found and relieved, the operation in advanced cases is not completed until the distended gut has been evacuated, and he considers that before the abdominal wound is sutured in such cases an opening should be made in the bowel above the obstruction, so that its contents may be readily discharged. By "advanced cases" may be understood those in which the operation has been delayed beyond forty-eight hours from the onset of the attack, and in which there is much distension and stercoraceous vomiting. The necessity of this will be seen when it is realized that in advanced cases the real danger to life is the presence of the poisonous material in the intestine and not the actual obstructing cause beyond its walls. This measure of treatment by evacuating the gut was vigorously advocated by Travers over one hundred years ago.

The best method of performing an enterostomy is by means of a Paul's glass tube of suitable size. In due course this artificial opening is closed by a second operation. The artificial opening is particularly fatal, however, in the case of infants and young children, and is to be avoided in cases of intussusception. We have been able to evacuate a greatly distended small intestine on several occasions by puncturing the first distended loop which presented in the small abdominal opening, and evacuating the contents into a basin. In one case (Case 4) it was possible to remove one hundred ounces in this way, and close the opening in the bowel immediately after. In a desperate case it will only be necessary to make a small incision in the middle line, and open the first distended loop which presents itself without searching for the obstruction.

2. *Spinal anæsthesia* has been used in the treatment of post-operative and other forms of ileus. It was first recommended by Wagner (Prag)[14] for paralytic post-operative ileus, but is now employed by Leriche, Meyer, Duval, and

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others for intestinal obstruction, no matter from what cause.

Chenut[15] believes that peristalsis of the intestine is controlled by two centres, the medullary which is inhibitory, and the ganglionic, which is excitatory. Ileus, he considers, is produced by excitation of the peripheral nerves of the intestine and their action on the medullary centres. Spinal anæsthesia, by suppressing the inhibitory action of the spinal cord, permits excitatory action of the ganglia and promotes intestinal peristalsis. On the other hand, Lapointe only found spontaneous evacuation in 5 per cent of the cases in which he had used stovaine spinal anæsthesia.

In all cases, except paralytic ileus, although one obtained a result from spinal anæsthesia, an operation would still have to be performed to remove the cause of the obstruction.

Duval,[16] after consideration of four hundred cases which he had collected, makes the following comments. (a) Spinal anæsthesia is contra-indicated in acute ileus should the patient be exhausted, toxic, or collapsed. (b) Spinal anæsthesia is not preferable to local anæsthesia in strangulated hernia. (c) Spinal anæsthesia is the method of choice in post-operative ileus, in which it is very frequently successful. Cœliotomy should invariably follow the satisfactory evacuation of the bowels brought about by spinal anæsthesia. (d) When successful relief of the ileus has been obtained by spinal anæsthesia, the subsequent operation is made easier for the surgeon and the patient alike, as the absence of distended intestine allows a freer and more thorough investigation.

3. *Cæcostomy.*—This is of value only in obstruction of the large bowel, and, as it is a relatively simple procedure, should be employed in all cases. It provides a safety valve and an ideal method for the administration of fluids, as water is absorbed through the large bowel only. It should be done under local anæsthesia. The stomach should be washed out before performing any operation for intestinal obstruction.

4. *The use of the rectal tube.*—In cases in which it is not thought necessary to do a cæcostomy, then the rectal tube will be found of great value. We got the idea of employing it from seeing Sir Arbuthnot Lane use it in ileo-colostomy, and observing how free these patients were from distension. With the hand in the abdomen it can be manipulated through the sigmoid to the splenic flexure. As in the case of the duodenal tube, we have found this instrument of the utmost value, as by its use the sigmoid can be made an effective barrier to prevent the small bowel from getting into the pelvis; secondly, it provides immediate and positive drainage for the large intestine; and thirdly, it provides an excellent method for the administration of fluids and enemata.

5. In cases of gangrene of the small intestine, if the patient's condition does not seem sufficiently good to justify the removal of the gangrenous bowel, then it should be brought outside and left. It can be removed extra-peritoneally at a later date.

6. Where one is dealing with multiple adhesions involving a large area of the small intestine, it is often safer to do a lateral anastomosis, thus short-circuiting the involved area, or an ileocolostomy, rather than to attempt to separate the adhesions, which is a long and difficult task.

7. Resection of growths should never be attempted in the presence of pus.

We should like to give very briefly the history of a few illustrative cases.

CASE 1

B. H., male, aged 8. After being ill at home for five days without medical attention he was admitted into the Wellesley Hospital almost *in extremis*, with pinched face, bright cheeks, dry tongue, and muttering delirium. His abdomen was greatly distended, tender, and doughy to the touch; the pulse almost imperceptible and very rapid; and the breath loaded with acetone. He was given 5 per cent glucose solution intravenously and cardiac stimulants. After a few hours the abdomen was opened, a ruptured appendix removed, and a pint of foul smelling thin pus aspirated. The large bowel was greatly distended, the wall red and thickened. A cæcostomy was done and the abdomen drained in several places.

The post-operative treatment consisted of the continuous intravenous administration of 5 per cent glucose solution (in all, 4200 c.c. were given before the needle became plugged); drainage of the stomach by the duodenal tube; the administration of pituitrin and physostigmine; and the introduction of fluids through the cæcostomy tube. The urine was examined daily for sugar, and if any appeared a suitable amount of insulin was given.

He gradually improved, but later developed a left-sided sub-phrenic abscess, which was drained. Continuous intravenous glucose was again instituted and continued until 15,000 c.c. had been given. There was only slight thrombosis of the veins, which did no harm. Two weeks later an abscess was evacuated from the left side of the pelvis, the adhesions obstructing the colon released, and the cæcostomy closed. The use of the duodenal tube kept him comfortable and prevented vomiting, and through it he was given glucose and laxatives.

This boy was practically moribund when admitted with diffuse peritonitis, obstruction, and pronounced acidosis. We consider his recovery due (apart from the operative treatment) to; (1) the relief of starvation by the continuous administration of glucose intravenously; (2) the use of the duodenal tube; and (3) the cæcostomy, which helped to relieve the obstruction and gave an entrance for fluids.

CASE 2

V. S., female, aged 10. This little girl, who lives in Northern Ontario many miles from a railway station and twenty miles from the nearest physician, was taken ill with abdominal pain and vomiting, and her condition three days later, when first seen by the doctor, was so serious that he thought it too late for operation. She hovered between life and death for eight days, and was then brought to the Wellesley Hospital, when her condition was found to be very similar to that of Case 1. She was given 1000 c.c. of 5 per cent glucose solution intravenously, with 15 units of insulin.

After some hours the abdomen was opened, a ruptured appendix removed, and two quarts of pus aspirated. The intestines presented a dark reddish appearance. Drainage was provided, she was given glucose continuously by the intravenous method, and a duodenal tube was inserted.

She made satisfactory progress for nine days, when intestinal obstruction developed. Four major obstructions were found, one at the ileocæcal valve, one at the duodeno-jejunal flexure, a third in the ileum about a foot from the cæcum, and the fourth in the pelvis due to an adherent coil of small intestine. A small collection of pus was also evacuated from the pelvis.

After this operation her pulse remained at one hundred and sixty for several days. Two weeks later a right sided sub-phrenic abscess was drained, from which she slowly recovered, and she is to-day as well as ever.

The duodenal tube was of immense value in the treatment of this patient as she refused to take albumin water or milk. It was left in for almost two weeks, being removed from time to time for throat gargle.

CASE 3

Mrs. S., aged 53. She had had two severe attacks of peritonitis in England twelve and ten years ago. She consulted us because of uterine hæmorrhage and obstipation, when examination disclosed large fibroids practically filling the pelvis. At operation the general peritoneal cavity was completely obliterated by adhesions between loops of small intestines. After an hour's careful separation of very dense adhesions the uterus was freed and removed. The appendix could not be found.

Following the operation the patient developed paresis of the bowel. Her blood chloride fell to 0.2 per cent, and her non-protein nitrogen was 92 mgm. She was given 5 per cent glucose solution by the continuous intravenous method. On two occasions 30 c.c. of a 30 per cent salt solution was administered intravenously, each time followed by bowel movements in a few seconds. After several days of anxiety the patient made a good recovery.

CASE 4

Mrs. M. M., aged 32. Hysterectomy, followed by intestinal paresis. She had persistent distension after hysterectomy for fibroids performed by another surgeon, accompanied by acute dilatation of the stomach necessitating frequent lavage. On the fourth day after operation, castor oil left in the stomach after lavage produced a free bowel movement, but only relieved the distension for a few hours. On the seventh day, under local anæsthesia in the patient's room, we re-opened part of the wound, took the first distended coil of small intestine which presented, and punctured it with a trocar, letting out one hundred ounces of fluid feces, when the whole intestinal tract collapsed. The bowel wall was so soft that the opening was closed with difficulty. There was no evidence of mechanical obstruction.

This procedure entirely relieved the patient and she made a good recovery.

CASE 5

Mrs. L. S., aged 25. This patient was operated on for a gangrenous appendix with diffuse septic peritonitis, when soft rubber tubes were used to drain the pelvis as well as the right kidney pouch. The patient progressed satisfactorily until the twenty-fourth day, when she suddenly complained of abdominal pain and vomited. As she had been eating strawberries and grapefruit twelve hours previously, the attack was at first attributed to this. However, twelve hours later she had another spasm of pain, when visible peristalsis could be made out. It was quite clear that she had developed mechanical obstruction, and an immediate operation was undertaken.

On opening the abdomen a mass of firm adhesions was encountered involving the terminal ileum and glueing this to the uterus, the right tube and ovary. These adhesions were carefully separated, when a second loop of small bowel was found adherent in the pelvis, causing an acute kink which completely shut it off. This adhesion was separated and the obstruction relieved. A small abscess was found in the pelvis behind some coils of small intestine. The rectal tube was passed up through the anus to the splenic flexure with the assistance of the hand inside the abdomen, and fastened in position by a suture to the skin of the buttock. This tube held the splenic flexure across the brim of the pelvis in such a way as to prevent the small intestines getting into the pelvis. She made a good recovery.

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THE KIDNEYS IN DIABETIC COMA*

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THE kidney function in diabetes mellitus differs in no way from that found in normal individuals, providing that the disease is kept under control. This conclusion is based upon many hundreds of analyses. (Practically every diabetic admitted to the wards of this hospital has a complete examination, both clinical and laboratory, including a study of the kidney function). Of course, in the absence of proper treatment, with persistent glycosuria and hyperglycæmia, that is, when the disease is active, cardio-vascular-renal changes may occur.

In diabetic coma, traces of albumin and showers of casts are almost constantly found. In four cases only, of one hundred records selected at random, did we fail to find these abnormal urinary constituents. With the exception of its transient nature and the similarity between the urinary findings, the kidney lesion found in this form of coma does not correspond, clinically or anatomically, with the well recognized forms of acute nephritis, nor is it related to chronic nephritis. Before the days of insulin, when recovery from coma was extremely rare, this absence of relationship was proved by post-mortem examination. Since the advent of insulin, there is further proof, in the fact that as the diabetic recovers from coma both the albumin and casts sooner or later disappear entirely. The time required is, as a rule, about ten days. In our clinic, the shortest period noted was two days; the longest was four months.

The possible degrees of kidney damage may be seen both from clinical and laboratory studies. Complete anuria for a period of twelve hours may be met with, and marked oliguria may extend over a period of two or three days. Retention of non-protein nitrogenous constituents of the blood is not uncommon. As far as the writer is aware, John[1] has reported the highest blood urea nitrogen value found, namely, 255 mgm. per 100 c.c. of blood. The highest in our clinic, in the absence of a previously existent chronic nephritis, was 101 mgm. The renal condition may be sufficiently severe to lead to all of the typical signs and symptoms of uræmia, and even to death, regardless of control of the acidosis, though, as Joslin states, this seldom occurs. As with most *acute* lesions of the kidney, marked urea retention does not necessarily indicate a grave prognosis. John's patient recovered.

The chief cause of this condition is probably, as Joslin suggests, damage of the renal cells by the acetone bodies. This may, however, not be the only factor. An analysis of our cases, both before and since the advent of insulin showed that though the incidence of albuminuria in the two groups did not differ greatly, the degree of anuria and retention of blood urea has been greater since insulin. Joslin's experience[2] appears to be somewhat similar in this respect. This author suggests that large doses of insulin may be a contributing factor. That insulin in some way may affect the kidneys is further suggested from two phenomena now generally recognized in some insulin-treated patients, namely, (a) œdema of the body tissues, and (b) raised renal thresholds with regard to glucose.

In the writer's experience, the degree of anuria appears to have been related not only to the dosage of insulin but also to the method of its administration. Insulin given intravenously appears to have led to greater degrees of anuria. It is, however, the ideal method of administering the drug to patients in coma, since the first object of treatment is the rapid restoration of the patient to consciousness.

A guarded prognosis is necessary when, in the absence of hypoglycæmia, drowsiness persists, in spite of the disappearance of the acetone from the breath and urine, and when the blood of such patients shows marked urea retention. With recovery from coma, the blood

* From the Department of Metabolism, The Montreal General Hospital, Montreal.

urea may rapidly return to the normal level; on the other hand, it may continue to increase for days, though the patient may have fully recovered from the coma.

Until recently we have had what appeared to be a reliable index of prognosis in the diazo-colour reaction made use of in uræmia. We, as well as others, have never found the reaction in any condition other than nephritis. Since our first experience with this test we have found it of particular value for prognosis in *chronic* nephritis. Individuals suffering from acute lesions of the kidney, such as acute nephritis, mechanical obstructions to the urinary outflow, etc., and whose blood at times gives the reaction, may recover; but we have yet to observe an individual with chronic nephritis who has recovered when the kidney lesion has progressed to the point of giving such a reaction. Further studies[4] have shown that the reaction is more related to the creatinine than to the urea content of the blood.

A positive diazo-colour reaction in diabetic coma was first reported by Gordon, Connor, and Rabinowitch.[5] The patient died. Since then all of six patients whose blood gave the reaction also died. Five of these individuals had chronic nephritis. Three of these five reacted well to insulin. Of the two remaining patients, one also reacted well to insulin. In other words, of these seven patients, it appears that four had renal lesions sufficient to lead to death and one of these was not a nephritic prior to the onset of the diabetic coma.

The following case was recently met with and is cited for two reasons, namely; (a) as an example of the possible course of events in such cases, and (b) because of the exceptional experience with the diazo-colour reaction.

A male, 35 years of age (Hosp. No. 5996/28) was admitted to the Montreal General Hospital, on October 18, 1928.

With the exception of his illnesses during the last twelve months prior to admission, his personal history was irrelevant. His family history was also irrelevant.

He was apparently perfectly well until one year prior to his admission, when he first observed that his appetite became ravenous. Since May, 1928, he had noticed polyuria, thirst and loss of weight. During the same time he had also had night sweats, occasionally pain in the chest, and had "coughed blood" at various times. On the day prior to admission (October 17, 1928), because he felt very weak, he thought he would try a large quantity of gin. Since it gave him no relief, he applied to the out-door clinic.

On admission, he had the usual features of the precomatous state of diabetes, including albumin and casts in the urine. The findings during the physical examination were otherwise negative. He received the necessary treatment, dietary and insulin, and, on November 7, 1928, was discharged from the hospital and referred to the out-door diabetic clinic. On discharge, he was well, except for the diabetes. The latter was under fairly good control. The urine was free of sugar and acetone bodies and contained no albumin or casts. (On the day prior to discharge, a faint trace of albumin was found, but there were no casts). The blood findings were as follows: Urea nitrogen, 17 mgm. per 100 c.c.; creatinine, 1.83 mgm. per 100 c.c.; sugar, 0.161 per cent; cholesterol (plasma), 0.264 per cent. There were none of the usual signs, clinical or laboratory, to suggest chronic nephritis.

Except for the gain of body weight, the findings during his subsequent weekly visits to the out-door diabetic clinic were not satisfactory. His home environment was such that proper diabetic management was practically impossible, in spite of the efforts of our Social Service Department. Glycosuria, though traces only, and hyperglycæmia, were frequently noted. He was last seen in the out-door clinic on January 8, 1929. On March 13, 1929, he was readmitted to the hospital.

On admission this time he was in coma and had the usual clinical and laboratory features of that condition, with the exception of the blood urea nitrogen; it was 35 mgm. per 100 c.c. He received one hundred units of insulin intravenously. The response was poor. Two hours later, the degree of coma, the respirations, the acetone odour, and other clinical features were unaltered. The blood sugar had increased from 0.588 per cent to 0.714 per cent. Fifty units of insulin were then given subcutaneously. One hour later there was some evidence of recovery. The subsequent events are of little interest with regard to the present discussion, except that from 8.30 a.m. March 13th, to 4.00 p.m. March 14th, he received 375 units of insulin.

On March 14th, at 4.00 p.m. the patient was obviously out of coma. The urine was free of sugar and acetone bodies, and the blood sugar was below normal, namely, 0.066 per cent, but the urea nitrogen had risen to 59 mgm. and the creatinine to 3.52 mgm. per 100 c.c. The diazo-colour reaction for uræmia was positive for the first time. On the following day the urea nitrogen was 67 mgm. and the creatinine was 4.10 mgm. per 100 c.c.; the diazo-colour reaction was strongly positive.

On March 16th, at 6 a.m. there was a marked change in the clinical picture. The patient complained of severe headache, developed dyspnœa and became drowsy. The urine at that time was free of sugar and acetone bodies but the blood sugar was 0.769 per cent. At 9 a.m. the blood sugar was 0.825 per cent. The urea nitrogen was 81 mgm. and the creatinine 5.66 mgm. per 100 c.c. So far as I am aware, this is the highest blood sugar record in the absence of glycosuria. The dyspnœa was paroxysmal in character and corresponded to the uræmic rather than to the diabetic type.

In view of the obvious renal block it was thought possible that just as the kidneys failed to excrete sugar, they also might have failed to excrete acetone bodies, and that the condition was probably diabetic coma. Wishart's test for acetone in blood was, however, negative. The sensitivity of this test is supposed to be about 1:20,000. The condition was therefore regarded as uræmia. He was given hot packs which led to improvement. The nurse's notes record the fact that the reaction to the hot packs was good. There was profuse perspiration and the headache was relieved. In view, however, of the marked hyperglycæmia the dosage of insulin was also increased.

During the afternoon of that day he was seen by Dr. A. H. Gordon who made the following note: "My impression is that this man has not got a chronic nephritis, but his present state is due to diabetic coma with a possible renal poisoning from the diabetic condition."

In another specimen of blood obtained that after-

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noon, Wishart's test for acetone was again negative. During the two following days the renal lesion became worse. The headache returned and the urea nitrogen and creatinine were 91 and 98 and 5.45 and 6.97 mgm. respectively. On both of these days, the diazo-colour reaction was strongly positive. The reports with respect to albumin in the urine were "plus plus" and "plus" respectively.

On March 20th, there was both clinical and laboratory evidence of improvement. The urea nitrogen was 84 mgm. From then on improvement was progressive. On March 25th, the urea nitrogen was 17 and on March 27th it was 11 mgm. The urine, however, still contained a trace of albumin and an isolated granular cast. On April 2nd, the patient was discharged from the hospital, "well", with the exception of a trace of albumin in the urine.

COMMENT

From the above it will be observed that a positive diazo-colour reaction when found in the course of diabetic coma does not necessarily indicate an unfavourable prognosis. The kidney lesion in this condition, severe as it may at times be, appears, so far as prognosis is concerned, to correspond to the many acute lesions met with clinically and which as a rule terminate favourably.

The disturbances of kidney function in diabetic coma may be summarized briefly as follows:—

1. No albuminuria (no disturbance). This is extremely uncommon.
2. Albuminuria
   (a) without urea-retention.
   (b) with urea retention. When this occurs the course of events may be as follows; (1) Recovery to the normal level after the acidosis has been controlled. (2) Progressive impairment for some days with eventual recovery. (3) Progressive impairment leading to uræmia. With uræmic symptoms, the patient may at times recover.

A guarded prognosis is necessary when, in the absence of hypoglycæmia, drowsiness persists in spite of the disappearance of the acetone from the breath and urine, and when the blood of such patients shows marked urea-retention.

In diabetic coma, as in all acute lesions of the kidney, a positive diazo-colour reaction does not necessarily indicate an unfavourable prognosis.

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ERYSIPELAS IN CHILDREN*

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THESE notes are based on the observation of cases of erysipelas treated during the past five years in the wards of the Alexandra Hospital for Contagious Diseases in Montreal. About 100 cases of this disease are treated each year in the wards of the Alexandra Hospital, and they may fairly be said to force themselves on the attention of the staff of the institution. They give more trouble and require more attention than any 300 other cases. Most of them are delirious for days. The aged and the infants, which between them make up the majority of the cases, mostly die. Every member of the staff wants to treat erysipelas in a different way, most methods of treatment being troublesome, disagreeable, and expensive. The cases look so repulsive, seem so seriously ill, and are so apt to relapse when they are apparently cured, that altogether they are a source of affliction to the institution. In the endeavour to draw some conclusions as to the course of the disease in children, the case reports of all children under twelve years of age treated in the Alexandra Hospital during the past five years, some 80 in all, have been collected and analyzed and give the following results.

First, as to age. It is rather surprising to note the great susceptibility of young infants to the disease; 39 of the 80 cases were under one year of age, *i.e.*, erysipelas was nearly ten times as common in the first year of life as in any other year of childhood. Also, this occurred in spite of the protected life of the

* Read at the meeting of the Canadian Society for the Study of Diseases of Children held at Vancouver, June, 1928.

infant, which should not have exposed it to infection. There was the greatest variation in the severity of the cases, some being profoundly toxic and ill, and others running a very brief and benign course.

Clinically they could be divided into three fairly distinct groups. First: facial erysipelas, usually quite toxic, with high fever and delirium, but running a brief course, ending with a sharp crisis, and practically all the patients recovering. Second: those affected in one extremity only, usually one leg, less toxic and also benign, practically all recovering in a brief period. Third: those in which the body was involved, the worst group of all, with a very high mortality and usually a prolonged irregular course. These three forms are almost like different diseases in their clinical course and prognosis, reminding one of the clinical difference between nasal, laryngeal, and faucial diphtheria. Now, it is very noticeable that the infants under one year of age develop almost always erysipelas of the body, while children over a year are practically in the same proportion as adults, *viz.*, 80 per cent facial; 10 per cent of one extremity, and 10 per cent of the trunk. Thus, of the 80 cases in question, 39 were under a year, and of these 30 showed involvement of the trunk with 60 per cent mortality. In only 9 was the disease limited to the face or extremities, and of these only one died.

Next as to infection. Erysipelas is obviously a contagious disease, due to several strains of streptococci, and responsible for terrible hospital epidemics in the past, but it is a striking fact that of all the 80 cases only 2 gave any history of possible exposure to any other case. More than 20 of them came from institutions where no other case had occurred and in which no other inmate contracted it. In other words erysipelas might be classed with pneumonia, so far as infection goes. Either the germs are widely prevalent and only cause the disease under certain circumstances, or else ordinary streptococci may cause a specific reaction under favourable conditions.

It is surprising how often erysipelas in children is secondary to some other pathological condition. In adults it is, of course, recognized that the specific streptococci enter through a wound but practically this portal of entry is seldom recognizable. However, in the 80 cases under discussion, in the vast majority the disease arose from some other condition, *e.g.*, otitis media, mastoid operation, wounds of the extremities, infected varicella pustules, impetigo, burns, vaginitis, chronic discharging sinuses, etc.

But it is the treatment of the disease which is of the greatest practical importance. There have been more methods of treatment advocated for erysipelas than for any other disease, even more than for whooping-cough, which is saying a good deal. There seem to be two main reasons for this. Firstly, erysipelas has an irregular course with an abrupt ending, and this favourable termination is apt to be ascribed to the last treatment used; and, secondly, the lesion is superficial, open to inspection, and it seems natural to expect that something could be applied that would arrest or cure it.

Anyone following a large number of cases of erysipelas soon reaches the conclusion that no drug treatment is curative, that nothing given internally influences its course, neither ergot, tincture of iron, nor quinine. Also, that nothing applied locally will stop its spread, neither carbolic acid, mercurochrome, corrosive sublimate, iodine, x-rays, nor ichthyol. Some of these may cause temporary relief, but a great deal of danger and discomfort to the patient may result if they are injudiciously applied.

If this general principle is recognized, much can be accomplished by treating the disease like any other acute specific fever, like measles, pneumonia or typhoid. In other words, general care and careful nursing, with the usual symptomatic and supporting treatment can help the patient a great deal, with, locally, only the use of some soothing lotion or ointment, abandoning all idea of abortive treatment by local application.

The hope for future advance, as in the case of most acute infections, seems to lie in the discovery of some specific antiserum. Our steps in this direction so far have been slow and stumbling. The first attempt was the use of polyvalent antistreptococcus serum. This had a few successes but there were so many failures that finally all abandoned it. The next effort was the use of blood transfusions in the

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hope that the blood of the donor might contain antibodies. With this again there were a few brilliant successes but a great many failures. The use of transfusions from convalescent patients, or of convalescent patients' serum, had more to recommend it and has been extensively tried. This method has two drawbacks, which are encountered in the use of all convalescent sera, *e.g.*, in scarlet fever and in measles. First, there is the difficulty in obtaining it; and, secondly, the impossibility of standardizing it. Sometimes it appears to be effective and in other cases that obtained from other convalescents seems to have no antitoxic value; so the general results have been equally disappointing.

Finally came the recent introduction of specific antistreptococcus serum, prepared from the organisms of erysipelas in the same way as the scarlet fever antitoxin and standardized by the use of the skin-test with toxin. The introduction of this serum has been largely due to the investigations of Dr. Birkhaug and of Dr. Amoss. Probably most physicians in America have tried it, as all have been furnished with innumerable advertisements regarding it, usually accompanied by the most extravagant claims. There are various reasons why one should not expect too much from such a serum. Erysipelas has been known for years to be due to many different strains of streptococci; the immunity it produces is most evanescent; the symptoms and complications of the disease are not so much due to a toxæmia as an actual inflammation and invasion of the tissues; and lastly the toxin skin-test seems most uncertain and unreliable. The serum from various sources has been used in the Alexandra Hospital in all cases of erysipelas for the past year and on the whole the results have been very disappointing. The mortality for the year in all cases of erysipelas, both children and adults, was 8 per cent; for the previous year, with almost the same number of cases, all treated without serum, it was exactly the same. There were a number of cases where the serum appeared to have striking results, producing a prompt arrest of the disease, but these were all cases involving the face or one extremity only. In no single case of erysipelas of the trunk in an infant was any definite effect of serum noted, yet these cases cause almost the whole of the mortality from the disease.

However, the fact that a certain number of cases react to serum, when given early in the disease, gives hope for the future, if the serum can be made more polyvalent, or some more accurate method of standardization can be discovered, but at present those who expect to get marked results from the use of serum in infants with generalized erysipelas are doomed to disappointment.

ETHYLENE AND OXYGEN ANÆSTHESIA.—Dr. H. P. Fairlie (Glasgow), in a paper on ethylene anæsthesia, said it could justly occupy a place among the regular methods of anæsthesia. If due care were taken to avoid cyanosis it was a safe anæsthetic. In the results obtained ethylene and oxygen closely resembled N_2O and oxygen; but there were two important differences. Ethylene produced a more profound anæsthesia, and was thereby rendered applicable to a wider range of operations. The second difference, an unfavourable one, was its unpleasant odour, not so much from the patient's point of view as for those who were working near it. The induction of anæsthesia was quite pleasant, though preliminary medication with morphine and hyoscine was desirable. The gas was rapid in its action and excretion, and after-effects as a rule were negligible. From the surgeon's point of view the main criticism lay in lack of muscular relaxation, and hæmorrhage. In operations where neither of these was of serious moment ethylene was adequate. The anæsthetist was working within fairly wide limits of safety, and ample warning of danger was always given by cyanosis. The gas could be given by means of any good gas and oxygen apparatus. Ethylene was very inflammable, and great care was needed in handling it. If rigid precautions were taken, however, he could see no reason why it should not be used. For many cases he considered it to be the anæsthetic of choice. Dr. K. B. Pinson (Manchester) referred to his experience of ethylene in dental work. In some cases where N_2O had failed to produce satisfactory anæsthesia, ethylene had been successful. The considerable amount of oxygen which could be given with it rendered it safer in some cases than N_2O. The one thing against it was its inflammability. The ignition point of ethylene and oxygen was very low. Dr. C. F. Hadfield drew attention to the valuable work done by Professor H. B. Dixon at Manchester University on the ignition points of anæsthetic mixtures. The explosibility of ethylene had been specially studied.—*Brit. M. J.* **2:** 253, Aug. 10, 1929.

THE ELIMINATION OF RICKETS IN ONTARIO*

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THE incidence of rickets has diminished markedly in Ontario during the past ten years. The marked manifestations of the disease, as shown by the infant who successively develops restlessness, sweating of the head, general loss of muscular tone, cranio-tabes, enlargement of the epiphyses of the ribs and long bones, and finally bone deformities such as knock-knees and bow legs, are now rarely encountered. In fact I can recollect having seen only one case with marked bone deformities in the infant wards of the Hospital for Sick Children during the past four years. Even cranio-tabes and evident enlargement of epiphyses are seen so infrequently as to constitute a real problem in the education of our medical students. Ten to fifteen years ago infants with this condition were encountered with singular regularity throughout the winter months. What factors have been at work to produce this marked reduction in the incidence of rickets in Ontario?

Sunshine and Skyshine.—Probably the most important agency for the prevention and cure of rickets is ultra-violet rays from natural sources, that is ultra-violet rays from sunshine and skyshine. Sunshine, and the reflected rays from the sky designated as skyshine, are composed of: (1) heat rays which are longer than 760 millimicrons in length (the unit of measurement, the millimicron, is one ten-millionth of a centimetre in length); (2) visible rays, which vary in length from 760 millimicrons, which we see as red light, to 380 millimicrons, which we see as violet light; and (3) invisible ultra-violet rays which extend down to 290 millimicrons. Only the rays shorter than 313 millimicrons in length produce an antirachitic effect. Thus the rays effective in the prevention and cure of rickets are the very shortest rays in sunshine. These rays, which are now known to be essential for life, constitute considerably less than one-tenth of 1 per cent of the total solar radiation.

During the past three years we have studied the variations in the anti-rachitic effect of sunshine throughout the year.[1] As was to be expected, we found that winter sunshine has only a slight antirachitic effect. A sudden increase occurs, however, as soon as the sun reaches a maximum daily altitude above the horizon of 35 degrees.[2] In Ontario this increase occurs between the middle and end of February, and continues until about the middle of October. During this period of the year sunshine has a very marked antirachitic effect, an effect roughly eight times as great as during the winter period from the middle of October to the middle of February.

A study was made of the antirachitic effect of skyshine and rather to our surprise we found that these rays from the sky have almost exactly the same value as the direct rays from the sun.[3] This means that ultra-violet rays from natural sources are obtained one-half from skyshine, the reflected rays from the sky, and one-half from the direct rays of the sun. The value of the skyshine throughout the year was found to vary the same as sunshine, that is it has a much lower value from the middle of October to the middle of February than during the remainder of the year.

These facts explain the almost complete absence of rickets during the summer months. During this period of the year almost every infant gets outside for some part of the day, and even if the patient receives only skyshine an effect is produced which, although less than optimal, is still sufficient to prevent the occurrence of rickets. There is little doubt that the general education of the public as to the value of sunshine and skyshine as a means for the prevention and cure of rickets has aided materially in the reduction of the incidence of this disease in Ontario.

Special Ultra-Violet Transmitting Glass.—

* Read at the forty-ninth annual meeting of the Ontario Medical Society, Hamilton, May 29, 1929.

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Skyshine or sunshine which has passed through ordinary window glass produces no antirachitic effect, as ordinary glass cuts off all rays shorter than 320 millimicrons in length. Special glasses are now available which will transmit a portion of the effective rays.[4] Although when new most of these glasses transmit from 70 to 80 per cent of the effective rays they rapidly deteriorate and at the end of six weeks transmit only from 25 to 45 per cent, at which level they remain constant. In considering the use of these glasses it must be remembered that the amount of ultra-violet rays available is very slight during the late fall and winter months. The chief use of these glasses then is during the latter half of February, March, April and May, during which time the sun's rays are very potent, but on account of our inclement weather it is practically impossible to expose any considerable area of our patients' bodies to the outside elements.

In order to obtain the most value from the use of ultra-violet transmitting glasses it is necessary for the patient to be in the direct rays of the sun which have passed through the glass. From the results of our experiments it can be mathematically calculated that a patient so situated will receive 12 to 15 per cent of the benefit he would receive if he were similarly exposed outside on the sunny side of the street. Of course it must be remembered that during the spring months only the patient's hands and face can be exposed outside, while inside, protected by this glass, the whole body can be exposed. This more than makes up for the reduction in the amount of rays available inside.

In regard to the value of special glass in north windows from our experiments it was found that a patient situated three to five feet from an ordinary sized window glazed with special glass, and receiving only skyshine through it, obtained about one-half of 1 per cent of the effect he would have obtained had he been placed outside on the sunny side of the street, and about 1 per cent of the effect had he been outside on the shady side of the street.

It is thus evident that in order to obtain much benefit from rays which have passed through special ultra-violet transmitting glass the patient should either lie in the direct rays of the sun with all or the greater portion of the clothes removed, or in a solarium exposed to rays from all the sky. In addition it should be remembered that the greatest effect is obtained at the middle of the day when the sun is at its height.

Other Antirachitic Factors. — As already stated the antirachitic effect of sunshine and skyshine is markedly reduced during the fall and winter months, and it is during the winter months that rickets is most frequently seen. What other means have we to prevent this disease? Briefly, there are three methods which we may use: (1) the exposure of the patient to ultra-violet rays from an artificial source such as the mercury quartz or carbon arc lamp; (2) the liberal administration of cod liver oil which contains the antirachitic substance or vitamin known as ergosterol; and (3) the administration of the activated ergosterol itself.

Mercury Quartz and Carbon Arc Lamps.— Ultra-violet therapy by means of the air-cooled mercury quartz lamp or carbon arc lamp is singularly effective in the prevention and cure of rickets. The quartz lamp is many times more efficient than the carbon arc lamp, but this does not mitigate against the value of the latter as the duration of the exposure may be increased to overcome this difference. The use of ultra-violet therapy from an artificial source, however, will never become an important factor in the prevention of rickets on account of the cost of the lamps. These lamps should be regarded simply as useful adjuncts to the other methods at our disposal. With certain severe cases of rickets which respond slowly to other methods of treatment they are most valuable.

Cod Liver Oil.—Cod liver oil has been used for many years for the prevention and cure of rickets. It is not the oil itself which produces the beneficial effect, but the antirachitic substance or vitamin which it contains. The concentration of this vitamin varies tremendously in different samples of oil; in some individual fish it is as much as 1,000 times as potent as oil from other fish.[5] Practically all the oils on the market now are biologically tested in order to ensure that the product does produce the antirachitic effect desired.

The widespread use of biologically tested cod liver oil has been a most important factor in

the reduction of the incidence of rickets in Ontario during the past ten years. Through the efforts of physicians, public health departments and other organizations, a mother is now rarely encountered who does not know that cod liver oil is of value for her infant. An erroneous impression which is still widespread however, is that rickets does not occur in breast-fed infants. This is contrary to fact, for we see just as severe rickets in breast-fed as in bottle-fed infants. All infants, whether breast-fed or not, should receive cod liver oil, starting at one month of age. The amount should be gradually increased from ten drops three times daily to one teaspoonful three times a day by the time the infant is two months of age. Dr. Martha Elliot recommends that two teaspoonfuls be given twice a day, as she found on account of the spoon rarely being completely filled that the infant received only an average of three teaspoonfuls a day. Three drams daily is sufficient in practically all cases to prevent or cure the disease. The oil should be continued for at least two years and after that it will be found to be a useful winter tonic throughout childhood.

The disadvantages of the administration of cod liver oil are the rather objectionable odour, the fact that the oil stains the clothes, and that many infants are unable to take the oil without vomiting. The best time to give cod liver oil is just before feeding. As many infants object to cod liver oil it frequently has to be administered forcibly. To obviate this difficulty with bottle-fed infants Goldbloom recommends the following procedure which he has found eminently successful:

"After the food formula has been made up take three teaspoonfuls of cod liver oil and two or three teaspoonfuls of ordinary white flour and blend in a saucepan. Then over a gentle gas flame add several teaspoonfuls of the formula, allowing it to thicken into a creamy consistency. Then add a cupful of the formula, mix thoroughly, and allow to boil for ten minutes. Add this to the entire formula for the day."

Irradiated Ergosterol.—One of the most striking discoveries of medical science made during the past five years is the observation that a substance known as ergosterol can be so changed or activated by exposure to ultra-violet rays that when fed to an individual it will prevent or cure rickets. The potency of the substance is most remarkable. One ten-thousandth of a milligram fed daily to a rat on rachitogenic diet will prevent the development of rickets. In fact it has been calculated that one ounce of activated ergosterol has the same antirachitic effect as 2 to 6 tons of good cod liver oil.[6] The substance is now being made commercially and dissolved in vegetable oils, so that two drops produce the same antirachitic effect as one or two teaspoonfuls of cod liver oil. There is little doubt that the use of this substance in a suitable dosage will be a most effective means for the prevention and cure of rickets.

The question arises "Are there any dangers to the administration of ergosterol?" Like every other potent drug tremendous doses are quite toxic. Pfannenstiel[7] Kreitmaier and Moll[8] Klein[9] and Shohl[10] have shown that when animals are given 50,000 to 100,000 times the minimum preventive dose they lose weight and die. Examination of the tissues shows parenchymatous degeneration and calcification of the blood vessels, kidney, heart, stomach and other organs. Shohl[11] has given 20 times and Hess[12] 100 times the average dose with no harmful effects. It would appear therefore that suitable doses of ergosterol may be used with no untoward results.

Irradiated Food Substances.—As ergosterol is present in many food substances such as grains, milk, etc., irradiation of these foods results in the development of antirachitic properties. Commercial firms are now starting to market irradiated foods. The medical profession will do well to obtain authoritative information as to the amount of the antirachitic substance present in these foods, not so much on account of the possibility of giving an overdose of irradiated ergosterol, but rather on account of the possibility that the amount of ergosterol contained will be so small as to produce only a very slight antirachitic effect. Unless the medical profession keep these points in mind we may be lulled into a false sense of security through feeding irradiated food stuffs. As an instance of this certain flours or cereals may be very efficiently irradiated and legitimately sold as irradiated food products, yet it will take several pounds of these irradiated food stuffs to produce the same

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antirachitic effect as two or three teaspoonfuls of cod liver oil.

With our present knowledge the use of irradiated ergosterol and irradiated food products must be approached with an open mind. We have just stated that some irradiated food stuffs produce very little antirachitic effect yet it is possible these foods may produce beneficial effects of which we now know nothing. We are just beginning to realize the importance of the various vitamins on the different phases of the body metabolism, and when we use ergosterol in place of cod liver oil we should remember that although we are giving a substance with a marked antirachitic effect we are not giving the various other vitamins contained in large quantities in cod liver oil.

CONCLUSIONS

Rickets can be eliminated in the Province of Ontario by the following means, which antirachitic measures should be instituted with infants as young as 3 to 4 weeks of age.

1. Exposure of infants to sunshine and skyshine. In the winter and spring months it is possible to expose only the face and hands, but in the summer months practically the whole body should be exposed.

2. The daily administration of three to four teaspoonfuls of a biologically tested cod liver oil. (Tested for vitamin D content). This is most important during the winter and spring months when it is frequently impossible to expose the infants outside for any length of time. It may be omitted during the heat of the summer when the infant is being exposed to sunshine and skyshine.

3. The use of special ultra-violet transmitting glasses. These glasses are of undoubted value under controlled conditions during the late winter and spring months when the antirachitic effect of sunshine and skyshine is very great and yet it is impossible to expose patients outside on account of the inclement weather. It is possible that in the late fall and early winter months, when the antirachitic effect of sunshine and skyshine is very low, an antirachitic effect of value may still be produced if sufficient of the infant's body is exposed to rays through these glasses.

4. The daily administration of activated ergosterol. Suitable doses of this substance dissolved in vegetable oil will soon be available to the medical profession. The pure substance has a simply tremendous antirachitic effect, but if given in large doses (50,000 to 100,000 times the minimal dose) it produces harmful effects.

5. The use of irradiated food. The medical profession is cautioned that the antirachitic effect of some of these irradiated foods may be very slight, and before relying on them as a means for the prevention of rickets an authoritative statement should be obtained as to their actual antirachitic value.

6. The use of the mercury quartz and carbon arc lamp. These lamps should be regarded simply as useful adjuncts to the other methods at our disposal. With certain severe cases of rickets which respond slowly to other methods of treatment these lamps are most valuable.

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There are many Egyptian days on which by no means or for any necessity is it allowable to let blood from man or beast, or to administer a (medicinal) potion. But of these days three are to be specially observed, namely, the eighth day of the Ides of April (April 6th), the first Monday in August, and the last Monday of December. This is to be carefully borne in mind, because all the veins are then full. But if on these days an incision be made into man or beast, (the patient) shall die immediately, either on the same day, or on the third day, or (at least) shall not survive to the seventh day, and whoever shall take a potion shall die on the fifteenth day; and anyone, male or female, born on those days, shall die an evil death, and whosoever on these days eats flesh of goose shall die on the fifteenth day. The "venerable" Bede. *De Minutione Sanguinis sive de Phlebotomia.*

NERVE LESIONS IN CIVIL PRACTICE*

BY ALEXANDER GIBSON, F.R.C.S. (ENG.),

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BEFORE the war, lesions of the peripheral nerves were regarded as rather uncommon incidents; their diagnosis was somewhat obscure; and the treatment, if it were attempted, was based upon the principles of tendon repair. Military experience changed the outlook. The problem of damaged nerves had to be faced time and time again. It was seen that nerve lesions were for the most part easily diagnosed, most of them indeed by a fleeting glance at an injured limb, by the gait of the patient, or by the attitude of his fingers.

It was soon seen, too, that the repair of nerves bore no resemblance at all to the repair of tendons. It was not enough to secure anatomical continuity. The bulbs marking the ends of a severed nerve were worse than useless, no matter how definite the evidence of nerve fibres in them. A regenerating nerve fibre will not jump a gap. The provision of an ensheathing protective medium, such as blood-vessel, fascia, decalcified chicken bone, or Cargile membrane, was the surest way to make failure certain.

The material used for suture was not unimportant. Various substances were tried. Catgut was definitely unsuitable; the damage done to the nerve in passing the suture was excessive, and the area of penetration became a liquefied core. Silk was found to provoke the least fibrous reaction. Tension sutures passing through the whole thickness of the nerve were used, only to be discarded in the light of experience. The slightest degree of tension would vitiate the result.

A successful tendon repair may give complete recovery; a nerve suture is almost never wholly a success. A gap in a tendon may be overcome by the use of grafts. A nerve gap can never be bridged in this way.

The net result of military experience was to bring clearly before us nerve lesions which had hitherto frequently eluded observation and to standardise to some extent our outlook and our treatment. This may be summarised in a few sentences. A certain proportion of our cases will obtain under favourable circumstances of repair a certain degree of recovery. In any individual case it is not possible to predict the amount or the speed of recovery.

As regards the operation of suture, it may be said that if it is possible to approximate the freshened ends exactly, without tension, one has a reasonable right to look for some degree of recovery. If there is tension or pressure, recovery is not to be expected.

A review of cases seen in private practice, from December, 1926, to April, 1929, *i.e.*, twenty-eight months, disclosed no fewer than seventy-three nerve lesions in sixty-nine patients. This excludes lesions of the brain, spinal cord, or sympathetic system, but includes peripheral nerves, both cranial and spinal.

ANALYTICAL TABLE

Upper Limb	*Cases*
Musculo-spiral	4
Ulnar	22
Brachial plexus	13
Median	9
Radial	3
Lateral cutaneous of arm	1
	52

Lower Limb	*Cases*
Sciatic	1
Tibial	1
Peroneal	4
Long saphenous	1
Short saphenous	1
Medial plantar	1
	9

Cranial	*Cases*
Trigeminal	4
Accessory	1
Facial	5
	10
Amputation bulbs	2

One patient had a triple lesion.

* Read before the Sixtieth Annual Meeting of the Canadian Medical Association, Montreal, June 19, 1929.

L. was engaged in blasting operations, and was making his exit from a tunnel when a charge exploded killing his mate and disabling him. Some twenty-eight pounds of rock were removed from his body (patient's history). When he came under my observation he had a septic knee joint, a complete lesion of both peroneal nerves, a complete lesion of the left ulnar nerve, and was still carrying about a fair quantity of rock.

One patient had a double lesion.

G. fell from a telephone pole, sustaining a crushing fracture of the left calcaneus, with a lesion of the posterior tibial nerve, and a forward dislocation of the semilunar bone, causing pressure on the median with pain on movement of the wrist.

One patient had a bilateral lesion of the brachial plexus.

D. was driving his truck over a mud road. It skidded, overturned, and pinned him underneath it in the ditch. There was weakness in the muscles supplied by the brachial plexus on the right side, particularly those depending on the median nerve. On the left side the weakness of the brachial plexus was still more marked, the hand showing the typical claw deformity. Two months later the right side had recovered completely. The ulnar paralysis and loss of sensation did not clear up on the left side until six months later. A special splint was made to control the ulnar nerve deformity of the fingers and proved in this case very efficient.

It will be observed that 52 of the 73 occurred in the upper limb, while only 9 were lower limb conditions. There are several reasons for this. (1) Many of the lesions observed were industrial cases, in whom the hands were more subject to accident than the feet. (2) The mobility of the upper limb and its segments permits overstretching and damage to soft parts, the bones and joints escaping the brunt of the strain, whereas in the less mobile lower limbs, violence is more likely to bring about fracture, while the soft parts escape.

The types of pathological lesion may be grouped under the following headings:—

		Cases
1.	Congenital	1
2.	Tumour	1
3.	Ischæmia	2
4.	Contusion	12
5.	Stretching	15
6.	Laceration	25
7.	Scarring	17
		73

Brief notes of some of the cases follow.

Congenital.—The patient, aged 13, was a deaf mute with facial paralysis. In this case the operation of hypoglosso-facial anastomosis was performed without much improvement. This is the only failure in a series of some twelve such anastomoses. Is it possible that the hypoglossal nucleus is also under-developed, owing to lack of use of the tongue for speech? Or is the facial musculature represented only by fibrous tissue?

Tumour.—This patient had a tumour removed from the right axillary region, the operation being followed immediately by drop-wrist. When seen, she had a complete musculo-spiral paralysis. Exploration high up in the axilla enabled the ends to be brought together, a mass of indefinite tissue being excised from between the severed ends. The report on this tissue was that it was a neurofibroma.

Ischæmia.—Both cases were typical forearm fractures, treated by too tight splinting. The nerve lesions were only part of the picture.

Contusion	*Cases*
Musculo-spiral	2
Ulnar	5
Median	1
Brachial plexus	1
Facial	2
Short saphenous	1
	12

Stretching	*Cases*
Musculo-spiral	1
Brachial plexus	11
Median	3
	15

Apart from direct stabs, it is practically always a violent separation of head and shoulder that produces a lesion of the brachial plexus. The process of birth may produce this lesion. Otherwise, a fall on the shoulder is the most common cause. Otherwise, a fall on the shoulder is the most common cause. In one case a widespread brachial paralysis followed either a dislocation of the shoulder joint or prolonged efforts to reduce it.

A word may be said here regarding cases of musculo-spiral paralysis following fracture of the humerus. Any of the three main nerves in the arm, median, ulnar, or musculo-spiral, may be injured or torn. Sometimes there is a persistent musculo-spiral paralysis in which the nerve is not torn but is stretched over a projecting piece of bone as over a pulley. An arbitrary period of three months is usually allowed for spontaneous recovery. It is usually stated that musculo-spiral paralysis is apt to

occur from involvement of the nerve in the callus of repair. This is probably doubtful. One has found a nerve lodged in a groove in a bony callus, or embedded in fibrous tissue and degenerated muscle between the ends of an un-united fracture, but never a healthy nerve caught and pressed upon by bony callus.

Laceration	*Cases*
Ulnar	12
Median	5
Peroneal	4
Lateral cutaneous of arm	1
Facial	2
Accessory	1
	25

In some of these cases the nerve may be one of several structures lacerated, say by a circular saw or a steel ribbon.

In the neighbourhood of the wrist there may be several tendons cut. A golden rule in such cases is to enlarge the wound well up the forearm. This will avoid missing altogether the fact that more tendons are cut than physical examination discloses; it may also avoid the risk of joining a nerve to a tendon.

One interesting case was that of A. T., a prospector lost in the bush. After many days of starvation, and torment from mosquitoes, he decided to end his life by severing the vessels at the wrist. Success attended his efforts to the extent of five tendons, the ulnar vessels and the ulnar nerve. He was rescued by a plane, operated on, and when last heard of was doing well.

A fragment of glass has an unpleasant way of penetrating the skin, sometimes to a considerable depth, severing a nerve such as the ulnar or the median, and then being withdrawn through a tiny skin wound. This is the type of accident which practically always calls for enlargement of the wound and careful exploration. Several cases of this character have resulted from street car accidents, where owing to the car lurching, the patient's hand has gone through a window.

Another cause of tearing of the nerve is the sharp edge of a fractured bone.

A nerve may be severed in the course of a surgical operation, such as the removal of enlarged glands from the posterior triangle of the neck, (accessory), opening up of the humerus for osteomyelitis of the shaft (musculo-spiral), or in the course of the operation for infected mastoid (facial). Another accident, which I have seen, though not included in the present series, is section of the dorsal interosseous nerve of the forearm as it winds through the fibres of the supinator muscle.

Scarring.—In connection with nerve injuries the word "scarring" must be interpreted very widely. It includes everything from involvement of nerve fibres in a clean aseptic scar to the tender adherent bulbs in a septic amputation stump. The one characteristic common to all cases is the presence of fibrous tissue in intimate association with the nerve.

The simplest form of this is found where an operative wound cuts across a cutaneous nerve of moderate size. Such a case is the following:

Mrs. R., aet 60, came complaining of pain over the lower end of the radius and the adjacent styloid process. The condition was diagnosed as thickening of the sheath of the abductor pollicis longus, and extensor brevis pollicis. On exploration the sheath was found to be thickened and was incised longitudinally. The pain disappeared, except for a single tender spot at the extreme upper end of the scar. Investigation showed that the incision had nicked the superficial branch of the radial nerve as it wound around the radial border of the radius about two inches proximal to the styloid process.

The condition mentioned has latterly been described as "stenosing teno-vaginitis"; so it may not be amiss to point out this little neural pit-fall. On all fours with this condition is one which may be met with as a complication of the operation for exploration of the internal semilunar cartilage of the knee. The patellar branch of the long saphenous nerve may be nicked or cut in the incision, and give rise to an area of anæsthesia and a tender point on the scar which persist long after the original condition has been recovered from. In neither case is there any excuse if one keeps in mind the presence of the cutaneous branch referred to.

Rather more common than this type of case is that where the nerve is caught in a terminal scar. This is particularly frequent after operations for amputation of fingers or toes. There is always a praiseworthy disposition to save every millimetre of tissue, and the consequence is that these amputations are often the seat of points of tenderness. They are generally readily dealt with by finding and resecting the adherent digital nerve.

Precisely analogous to these was the case of G., who sustained a lacerated wound of the left arm below the deltoid insertion. This was treated successfully by a Thiersch graft about four inches by three inches. On it there were several tender spots, and after use of the arm

at work aching was complained of as high as the shoulder. Exploration showed the terminations of three large cutaneous nerves in the scar, the lateral cutaneous and the two dorsal cutaneous nerves of the forearm from the musculo-cutaneous and musculo-spiral nerves respectively. Resection of these produced freedom from pain.

It will be noticed for the most part that pain is the outstanding feature of compression of nerves by fibrous tissue. There is likely to be loss of motor activity, but pain of variable intensity is practically always present. A specialized example of this is found in the case of the ulnar, in the condition known as "late ulnar paralysis" of which there are two examples in this series. "Late ulnar paralysis" is always the end result of a fracture of the lateral epicondyle of the forearm, generally sustained in childhood. Ten, fifteen, twenty, thirty or forty years afterwards, the ulnar nerve shows the sequel. Typical is the case of:

L. L., aged 40. This patient came complaining of weakness in the muscles of the right hand. He had been a barber for some sixteen years and recently had found himself unable to do a full day's work without the hand tiring excessively. During the last two years there has been wasting of the interossei. At the age of five he had an injury to the right elbow.

On examination sensation was lost over the typical ulnar area. There was marked wasting of the interossei, notably the first, and to some extent also of the hypothenar eminence. Examination showed an old fracture of the external condyle of the humerus, and this was confirmed by x-ray.

At operation, the ulnar nerve was found to be compressed by a thickened adherent sheath. This was dissected off, and the nerve fibres isolated from one another. The nerve was subsequently transplanted to the front of the elbow joint. Discomfort ceased at once. He returned to his work two weeks after operation, and when seen two months later, was able to do a full day's work without any sensation of tiredness. There was slight return of sensation in the ulnar area.

The most striking case of nerve compression from fibrosis as the result of injury that I have met with is the following:

Mrs. D., aet 46, housewife. She was seen for the first time on April 2, 1928. On December 11, 1923, a window fell on the forearm and broke it. The arm was "set" in the country. She then came to Winnipeg and had baking and massage for six weeks. The arm was still painful and was opened up on March 11, 1924. Since the operation the hand has been worse than useless. The wrist became flexed and the fingers flexed into the palm. Plasters to overcome the flexion were applied on seven or eight occasions.

On October 11, 1924, another operation was performed and a piece of the nerve was removed. In June, 1925, advice was sought elsewhere, but nothing further was done. The condition became steadily more painful and the patient came considering the advisability of amputation.

On examination, the patient kept the left hand closely to the side. It was strongly palmar flexed. The skin of the hand had not been washed. It was scaly and excessively tender. The fingers and thumb were strongly flexed. The thumb and forefinger showed changes in the ungual region characteristic of nerve loss.

The report of the surgeon who explored the nerve on March 11, 1924, was as follows: "The condition of the median nerve was explored from the flexor crease at the wrist downward for an inch and upward for two inches. Its appearance was entirely normal."

On July 13, 1928, the median nerve was explored. The sheath was found firmly adherent to the nerve and the individual fibres were firmly bound to one another. About an hour was spent freeing the sheath from the nerve and separating the individual fibres from one another until the median nerve presented the appearance of a flat leash of fine fibres instead of a rounded cord.

On July 23rd the stitches were removed without pain. All dressings were discarded on July 26th. The patient was seen for the last time on March 14, 1929. There was no pain in the hand or in the fingers. There was loss of sensation in the thumb and index finger, the result of the resection of October 11, 1924. The flexor carpi radialis showed contracture, but patient was content to keep the hand as it was.

This brings up the question of dealing with nerves the subject of compression. It is not enough to inspect the nerve. Incise the sheath. In the normal nerve the sheath can be pushed from the nerve by a blunt instrument. If sharp dissection is necessary the sheath is adherent and the condition is likely to be painful. Separation of the individual fibres is a long and tedious process. The word "hersage" has been used to describe the operation. The results are as a rule very gratifying. The term neurolysis denotes rather the separation of a nerve as a nerve cord from a sheath of adventitious fibrous tissue.

An interesting example of fibrosis of a nerve is sometimes met with on the medial side of the heel. There is tenderness in the area of distribution of the medial calcanean nerves. This tenderness is sometimes associated with thickening of the posterior tibial nerve just behind and below the medial malleolus. This condition may be a sequel to a crushing fracture of the calcaneus. In other cases there may be no history of accident. Some of these patients have the habit of kicking the inner side of the ankle with the heel of the opposite shoe, and this, long-continued, may lead to scarring of the posterior tibial nerve.

Cranial Nerve Lesions.—Four patients presented lesions of the trigeminal nerve. Of these one was a typical tic douloureux, and the usual excellent result was obtained by resection of the sensory root.

A second patient suffered from pain in the trigeminal distribution, following an attack of herpes facialis. This was accompanied by re-

curring crops of vesicles, which left behind them small scars involving the whole thickness of the skin.

Two other patients had neuralgia confined to the mandibular division of the trigeminal nerve. This was treated rather simply by resection of the inferior dental nerve, and through the same incision, the buccinator nerve. A small incision inside the mouth allowed resection of the lingual nerve. In both cases the pain was completely abolished.

Facial.—Of the six cases of facial paralysis, one was congenital and two followed fracture of the skull. Of the other three cases one followed the opening of a parotid abscess, and the others were consequent on a radical mastoid operation. Three cases had a hypo-glosso-facial anastomosis performed.

The treatment of permanent facial paralysis is not standardised. Some join the spinal acessory to th efacial stump. Recently a plea has been made for the use of the glosso-pharyngeal, in order to avoid associated movements of the tongue or shoulder. In my own cases, these associated movements have not been observed. With one exception all the cases operated on have regained muscular tone and voluntary movement in the paralysed muscles. None have obtained an emotional response, although recovery including this has been reported by other surgeons. The loss of half the tongue musculature has never proved a serious disadvantage. One patient, a minister, preached a sermon to his congregation ten days after his operation.

The Accessory.—In one case the spinal accessory nerve was severed in the course of removal of tuberculous glands in the posterior triangle of the neck. It was possible to identify and unite the severed ends.

MEDICAL TREATMENT

Conservative treatment consists essentially in the lapse of time. Massage and electric stimulation are of little importance. After watching the effect of galvanism and faradism in several hundred cases of nerve lesion, I doubt if its value be not almost entirely psychic. No amount of electric stimulation will bring back nerve function if the anatomical interruption be not overcome, and if the anatomical interruption be adequately overcome, electricity is probably not necessary. Massage is of value if it be done correctly. I prefer to use the term "skin-stroking" rather than massage. That is often better carried out by the patient's relatives than by the professional rubber, who does not always envisage the difference between a muscle deprived of its nerve supply and one the seat of fibrositis.

It is not always possible to tell when a nerve is severed and when it is merely contused. This uncertainty is most probable in cases of fractured humerus. As a working measure, the space of three months is devoted to conservative measures—splinting and massage. If at the end of this time there is no definite return of function, exploration should be undertaken.

OPERATIVE TREATMENT

The following operations were performed.

	Cases
1. Freeing from bony pressure...	4
2. Neurolysis and "hersage"....	8
3. Resection	8
4. End to end suture.....	12
	32

Several types of operation were performed. The simplest was that of freeing the nerve from bony pressure. Of this there were three cases: musculo-spiral, one; median, one; posterior tibial, one.

Resection was performed for adherent bulbs in amputation stump (2) and for adherent terminal scars. It was also employed in three of the trigeminal cases.

Neurolysis and "hersage" were employed in eight cases. Of these two were examples of "late ulnar paralysis" and included transplantation of the nerve to the front of the elbow as well as freeing it from fibrous tissue.

The most exacting operation technically is that of end-to-end suture. Twelve of these were performed, with some degree of improvement in most that were done six months ago or more, with complete recovery in none. It is not generally realized that recovery of sensation may be as important as recovery of muscular power. In one patient who had the ulnar nerve sutured across a considerable gap and in whom the recovery of sensation was negligible, amputation of the two distal phalanges of the ring and little fingers had to

be performed for persistent ulceration. This patient worked in the north country, often far from medical aid, and he found the stumps more useful than longer digits liable to break down and become infected under severe winter conditions.

The technique of end-to-end suture is a delicate one. There are many details that cannot be described on this occasion. The finest ophthalmic needles and the finest silk are none too fine for the work.

The surgery of peripheral nerves has no attraction for the impatient. Results are always slow in coming and are often incomplete. Disappointments are frequent, and hopes are often raised in the first few weeks which fail to materialize as the months go by. There are few dramatic moments such as come from, let us say, removal of pressure upon the motor cortex, and yet in the majority of nerve lesions we meet something can be done to improve the patient's condition. It may be that exploration shows an unbridgeable gap; then we know at least that the injury is permanent, and can seek by tendon transplantation or otherwise to minimise the disability.

In the large group of cases where pain is the outstanding feature, we can do a good deal, much more indeed than is generally realized, to make the patient's condition more tolerable. R. L. Stevenson has said,

> To travel hopefully is a better thing than to arrive.

It is questionable how far the practical-minded surgeon is entitled to apply this maxim to his handiwork. In the domain of the peripheral nerves he may reach a destination not far removed from his starting point, but it is better at least to have travelled hopefully than not to have travelled at all.

METHODS AND RESULTS IN PERIMETRY*

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THE adoption of proper methods in the practice of perimetry is quite as important as is finished technique in surgery. In either instance a well thought-out system is apt to yield the best results. In surgery, each case becomes an individual problem, in which the technique must be varied to meet the requirements. Perimetry differs, however, in this respect. If the case is not of a definite character and so diagnosed, a preliminary study must be made in order to determine which part of the field will require searching analysis to accurately determine the extent of the defect. For this purpose, a routine instrument is advantageous. The essentials which should be embodied in such an instrument are: first, simplicity; second, ease of application; and third, a fair degree of accuracy.

The hand campimeter, in my experience, fulfils these requirements. It was offered to the profession for exactly this purpose, and no further claims were made for it, although in the hands of one who has mastered its technique it has far greater value. In the use of any routine instrument, time is an important factor, and simplicity in application helps to save time. As a routine instrument, the tangent screen of short radius serves a two-fold purpose. It first calls our attention to the part of the field in which disease exists; and, in the second place, if the technique is properly followed, in a large proportion of cases it accurately outlines or determines all the field disturbance which can be uncovered by special technique.

SPECIALIZED PERIMETRY

Having determined the part of the field which may require more searching study, the special instruments available for such study are the following: (1) for central field studies; (a) the Ferree-Rand slate, (b) the Lloyd slate, (c) tangent screens of long radii, (d) stereo-campimeters; (2) for peripheral field studies, standard perimeters.

The Ferree-Rand slate.—I stated above that

* Presented in amplified form before the Ophthalmological Section of the Toronto Academy of Medicine, on March 11, 1929.

in the hands of one who has mastered the technique of the hand campimeter, it will uncover any defect, whether central or peripheral. If the defect is in the peripheral field, determined by a very small test object, it would be inadvisable to fail to study such defect by means of the instrument specially designed for and capable of faithfully outlining a peripheral defect, namely, a properly standardized perimeter. In the central field, one may wish to make further study of a central defect. Although all the standard instruments in this group will be discussed, in my experience the Ferree-Rand slate is the most valuable and accurate, and I have found it to be applicable to the correct study of any central defect which I have encountered in my clinical work. Its greater accuracy and superiority, as compared with tangent screens of long radii, will be discussed at the proper time. For the present, I wish to call attention to its value as standard in all respects in which standards can be applied, in illumination, fixation, minute test objects, and in pre-exposure and surrounding field, if the latter is desired. The scotomas of toxic amblyopia and amblyopia *ex anopsia* require the most refined technique to outline their borders. They are easily and definitely outlined on the Ferree-Rand slate. A luminous point of light serves as a fixation point. Added to this is the probable development of Cowan's new mirror device which admits of binocular stereoscopic fixation with exclusion, at the same time, of the fixing eye from the central field. This latter method, when perfected, promises new developments in the outlining of a central scotoma.

We are not concerned at this time with minutiæ of detail in the rapid presentation of methods. A few facts, however, should be definitely stated in order to make our presentation comprehensive. They are:—

First, any satisfactory method of study should have standard and uniform illumination. To state the degree dogmatically, at the average distance employed, 7 foot candle power artificial daylight is now regarded as standard.

Second, fixation should be as perfect as possible. To obtain this, and in order to train the patient to concentrate on the point of fixation, it is always best to begin the study by outlining the blind spot of Mariotte. When one fails to make this an initial study, he is often chagrined to find, at the end of a prolonged study, that his work is valueless because the patient was not trained to maintain perfect central fixation.

Third, the size of the test object should be standard. By this is meant the test object for form should be the smallest stimulus that an individual patient can see within the 20° circle. In an average case, this should not exceed 30 minutes, and in many cases, it will be as small as 10 minutes. Coloured test objects, at an average range of 333 mm., should subtend an angle of 1° and at shorter range should not be less than 30 minutes. Any smaller coloured test object is apt to give rise to error and inaccuracy.

Fourth, in the use of coloured stimuli, which is part of standard technique, pre-exposure and surrounding field should receive due consideration when minute depressions in the peripheral field are under investigation.

These four requisites should be regarded as standard, and any method which does not include them can hardly be regarded as standard and worthy of serious consideration.

The Lloyd slate.—This is an instrument of much value in carefully selected cases. Because of its mechanical limitations, it can only be regarded as a specialized tangent screen. Stereoscopic fixation is its great feature. It is especially adapted to a study of the blind spot of Mariotte, central glaucomatic scotomata and any unilateral central field defect, if the muscle balance is practically normal. If this slate were marked as are other instruments, its value would be much enhanced. It is an important unit of a complete perimetric equipment, although not strictly essential.

Tangent screens of long radii.—The profession is divided as to the intrinsic value of screens which are operated at a radius of one and two metres. Many still believe that they furnish the only accurate means of outlining a small scotoma. My first studies in perimetry were made with this type of screen, and I naturally was impressed with the value of the method. I devised several for my personal use in which the average normal blind spot was carefully outlined. The difficulty in obtaining standard illumination and accurate fixation soon led me to more refined methods of study. Their impracticability in an average office is a third objection to their use. Finally, the addition to

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one's equipment of another, and what I now believe to be a supernumerary, instrument, which is less accurate than other instruments of shorter radii, led me to abandon this part of my equipment, save for the study of the occasional tubular field found in hysteria. We are creatures of habit and environment, and unless one thinks for himself and tends to develop the creative faculty with which we are all endowed, we are apt to cling to the old and fail to avail ourselves of new and better methods. I personally believe that tangent screens of long radii cannot compare in accuracy with those of short radii, because they do not admit of or embody the four essentials laid down as standard. In addition to lacking these essentials, these instruments are cumbersome, unwieldy, and obtrusive in a modern office.

New stereo-methods.—If the Cowan principle is practicable—exclusion of the fixing eye from the central field by a mirror so placed as to enable the patient to fix stereoscopically—one of the greatest advances will have been made in studying the central field. I have been working on its adaptation to my hand campimeter and to the Ferree-Rand perimeter and slate, and it now seems to be quite feasible and practical. It will offer an easy solution of studying unilateral central defects, as in amblyopia *ex anopsia*, toxic amblyopia, and in all defects which may occur in the 20° circle.

Standard perimeters.—In our discussion thus far, we have been concerned with the central field, an area in which probably 80 per cent of our serious abnormalities are found. For these studies, a form of tangent plane is essential. To attempt to study defects in this area by means of a perimeter is as foolish as to attempt to deliver a lens dislocated into the vitreous by one of the usual methods employed in extracting the normally located senile cataract. In studying the peripheral field, on the other hand, only a standard perimeter should be employed. We are concerned in the recognition of early and moderate contraction. Furthermore, retinal sensitivity diminishes from the macula to the periphery, and in the extreme periphery it is important to be able to differentiate between a true but moderate field contraction and a contraction which may be caused by inaccurate methods.

In this study, therefore, it is not only important to have standard illumination, perfect fixation, and accurately gauged stimuli, but pre-exposure and surrounding field, which were not so essential in the central area, now become potent factors in separating the true from the false in field contraction. There are two clinical conditions in which each of these factors may seriously influence a diagnosis. They are the neurological cases referred to us for study, and the early glaucomas, when the first field defect may be in the form of a Roenne step. In my eleven years of neurological study and teaching, before electing to practise our most satisfying specialty, I learned to appreciate the value of a careful ophthalmological report, in contrast to the misleading signs of inaccurate field and incomplete fundus studies. Many neurologists of to-day look with suspicion upon some of the field studies submitted in their cases, and many amateurish attempts are made by the neurologists themselves, with the ophthalmoscope and perimeter, in their desire to obtain what they regard as dependable data. Are we not largely responsible for this medical medley? I am not so much concerned in dissuading the neurologist from annexing ophthalmology as a minor branch to his own field as I am in urging greater accuracy in our reports and studies of neurological cases. The neurologist can increase his efficiency in his special branch by using the ophthalmoscope and the perimeter. It is doubtful, however, whether few, if any, acquire the skill of making refined diagnoses in these special departments of investigation, such as can be made by the careful ophthalmologist whose function it is to develop accurate technique in this special field. The doubt, however, with which some of our reports are received by the neurologists is justified. The remedy lies in more accurate work on our part, and not in equally mediocre work on the part of the neurologist in a field which is allied to, but apart from, his special field of work. From my own personal experience, I am convinced that dependable perimetric technique can only be acquired by long and persistent practice.

PERIMETRIC STUDIES MADE BY LAY ASSISTANTS

It is not inappropriate to discuss this subject in connection with a study of methods. Many ophthalmologists feel that their time is wasted in giving their personal attention to this purely mechanical department of a busy

office, and when field work is done, it is relegated to a nurse or a lay office assistant. No more serious error could be committed. If the practice of perimetry were purely a matter of mechanical technique many laymen might qualify better than some of their chiefs. There is, however, much more involved. A good perimetrist must know his clinical ophthalmology. He must have more than a passing knowledge of the physiology of vision, and he should know minutely the anatomical distribution of the retinal nerve fibres, the gross anatomy of the visual pathways, as well as the regional brain anatomy along the visual pathways. No ophthalmologist who has a fair knowledge of these subjects will feel safe in committing the matter of field-taking to a lay assistant in his office. Furthermore, when one has fully learned to realize the diagnostic possibilities of which perimetry is capable, he will feel that the work will demand his personal attention, unless he has a trained medical assistant whose work he can faithfully trust. One need not delve into neuro-ophthalmology to find confirmation of this truth. How many of the ophthalmologists present to-night, if the victims of glaucoma simplex, would be content to risk their eyes to the care of a fellow ophthalmologist whose perimetric work is performed by a lay assistant? The mere fact that he relegates so important a phase of his office routine to a layman would classify him as an unscientific ophthalmologist, who probably is also lacking in other phases of his medical equipment. I daresay few of us would feel that we would care to commit ourselves into his keeping. One frequently hears the excuse, "I'm too busy to do my own perimetric work." If we are too busy to do this work, are we faithful and honest to our clientèle as to the manner in which we conduct our obligations to them? Are we giving them a *quid pro quo* for their fees and their confidence expressed in entrusting themselves into our hands? The lay assistant is a valuable asset in a busy office, but one should learn to properly appraise his or her limitations.

There are many other methods in perimetry which should be discussed, and many other instruments which should receive consideration. The scope of this communication, however, does not admit of a complete review of all the phases of perimetric study that are worth while. The object of this communication is to simplify our methods and discuss only those phases which, to the writer, seem to be basic and fundamental.

LATE RESULTS OF THE MANITOBA EPIDEMIC OF POLIOMYELITIS OF 1928*

By Mary McKenzie, B.Sc. (Med.), M.D.,

(*Gordon Bell Fellow of the College of Physicians and Surgeons of Manitoba*)

Winnipeg

In the April number of this *Journal* a résumé was given of the results of convalescent serum therapy in acute poliomyelitis in the Manitoba epidemic of 1928,[1] and in April also the complete report of the Medical Research Committee of the University of Manitoba on this epidemic was published as a Report of the Department of Health and Public Welfare of this province.[2] The latter will be subsequently referred to as the M.R.C. Report.

It seemed desirable to ascertain as far as possible the final results of the cases in the epidemic with especial reference to two points; first, whether any of those cases which were treated with convalescent serum in the pre-paralytic stage and appeared to recover completely subsequently developed any degree of paresis or paralysis; and second, the relative proportion of complete recovery, after a reasonably long interval, of treated and untreated cases.

In April last the Medical Research Committee sent out the following circular to the parents of each of the 398 surviving cases of the epidemic (*cf.* McKenzie, Cameron, and Douglas, M.R.C. Report, p. 23).

* From the Gordon Bell Laboratory, Faculty of Medicine, University of Manitoba.

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Medical College,
Winnipeg, April 24, 1929.

Dear Sir or Madam,—

Your child ..... is reported in our list as having had poliomyelitis (infantile paralysis) in ..... 1928.

The Medical Research Committee wish to make certain that as far as possible further treatment is being given to all cases whose after-condition renders that desirable, in order to lessen the effect of the partial paralysis which sometimes persists or develops in these cases. You will help us if you would be kind enough to fill up the following form and return it as soon as possible in the envelope enclosed with this letter.

Yours very truly,

MEDICAL RESEARCH COMMITTEE.

FORM OF ENQUIRY

Is ..... perfectly recovered from the attack of infantile paralysis? .....
If not, what do you notice unusual about his (her) condition? .....

For example:—

Is there paralysis of any part of the body?.....
Is there any dragging or shortening of either foot?....
Is there any weakness of either wrist?.....
Is there any other noticeable deformity?.....
Is there anything else that you think unusual?.....
Is ..... under the care of a doctor?.....
If so, please state the name of the doctor .....

Replies were received concerning 198 of the 398 cases. These have been checked as far as possible through the patients' physicians and through personal investigation. I have been able, through the physicians and the parents, to obtain recent particulars concerning 77 additional cases, so that reasonably accurate data are available for 275 of the 398.

The data that have been obtained through this recent survey will be analyzed in two parts; the first dealing with the information available concerning the 161 cases especially dealt with in the report on the results of convalescent serum therapy (M.R.C. Report, p. 43), the second dealing with information concerning cases other than these 161. These results concern the condition of patients from the epidemic at least six months after partial or complete recovery from it.

I. FINAL REPORT ON THE 161 CASES PREVIOUSLY COMPLETELY STUDIED

From Table I of the Report just referred to the following Table I is derived.

TABLE I.

SUMMARY OF RESULTS AT TIME OF PREVIOUS REPORT

	Serum in pre-paralytic stage	*Serum after onset of paralysis*	*No serum*
	No. of cases	*No. of cases*	*No. of cases*
Complete recovery	69	7	14
Residual paralysis	5	15	35
Deaths	0	11	6

Recent data concerning 117 only of these 161 are available. These, somewhat similarly analysed, give the results shown in Table II.

TABLE II.

CONTRAST OF RESULTS IN EARLIER AND PRESENT REPORTS

Previous report	*Present report*	*Serum in pre-paralytic stage*	*Serum after onset of paralysis*	*No serum*
	No. of cases showing			
Complete recovery	Complete recovery	52	4	5
Complete recovery	Subsequent paresis or paralysis	2	0	0
Complete recovery	Subsequent death	0	0	0
Paresis or paralysis	Complete recovery	1*	3	10
Paresis or paralysis	Paresis or paralysis	5*	13	22
Paresis or paralysis	Subsequent death	0	0	0

* It will be noted that there is a discrepancy between the 5 serum-treated cases showing residual paralysis in Table I, and the (5 + 1) similar cases in Table II. The latter figures have been re-checked and seem to be the accurate total for the 161 cases.

The points of interest in Table II are: (a) the extent to which patients exhibiting apparently complete recovery after some weeks subsequently retrogressed, to exhibit some degree of paresis or paralysis; and (b) the extent to which a definite paresis or paralysis still exhibited one or two months after the attack improved subsequently.

(a) Of the 60 cases treated with serum in the pre-paralytic stage 54 (90 per cent) appeared to have completely recovered shortly afterward, and 52 of these have maintained this condition. The two exceptions require consideration. Unfortunately the known data are not as complete as is desirable.

1. Rhoda R., female, aged 14. Date of onset, Sept. 11, 1928. Headache, soreness in neck, back, and calves of legs, nausea and vomiting. Temperature, 101.5° F. Irritability. Next day, drowsiness, but other symptoms improved. Spinal fluid cell count, 20. No increase in globulin. Admitted to the King George Hospital on the 12th. One dose of 25 c.c. serum given intramuscularly. No paresis or paralysis developed.

Present condition.—Her physician reports (June, 1929) that she has a slight foot-drop on the right side.

2. Lorna M., female, aged 3. Date of onset, Sept. 7, 1929. Fever, loss of appetite, drowsiness. On the 8th, much the same. On the 9th, she complained of pain when lifted. On the 10th, abdominal pain, positive spine sign, head retracted, drowsiness, irritability, fever. Spinal fluid 37 cells; a slight increase in globulin; characteristic colloidal gold curve, 0123210000. She was given 22 c.c. of serum intramuscularly on the 10th. On the 11th, temperature normal. She was sent to the

King George Hospital. On September 18th she had entirely recovered. No paresis or paralysis.

Present condition.—Her physician reports that this patient was last seen in March, when she showed slight dragging of one foot. She has since been lost sight of.

There would appear, therefore, to be a very slight degree of paralysis in two of these 54 cases, the onset of which was unusually delayed.

These late results in no way contradict the conclusions in the earlier report as to the beneficial action of convalescent serum, but are in good general agreement with those conclusions, the relative proportion of complete recovery of treated and untreated cases being virtually that already given in the earlier report.

(b) Of 6 cases treated with serum in the pre-paralytic stage and subsequently developing paresis or paralysis, one showed a delayed complete recovery. Of 16 treated with serum after the onset of paresis or paralysis 3 showed a delayed complete recovery, and of 32 untreated with serum 10 showed a delayed complete recovery. (These figures of course do not include the earlier recoveries).

These figures suggest that such delayed recoveries occur more frequently in the untreated cases than in those treated in the pre-paralytic stage. This conclusion is based upon too small a series of cases to stress. It may indicate acceleration of recovery by convalescent serum treatment. It cannot indicate the opposite conclusion, so that as far as it goes it is favourable to the serum treatment.

Some data are available concerning partial improvement. The 5 cases treated with convalescent serum in the pre-paralytic stage (Table II), which showed at the time of the earlier report some degree of paresis or paralysis and still show it, nevertheless, according to the statements of their physicians, have shown and are continuing to show definite improvement. Eleven of the 13 cases who received serum after the onset of paralysis and still show paralysis have been improving. (A twelfth was improving but died of pneumonia apparently unconnected with the poliomyelitis). The same may be said for 17 of the 22 untreated cases still showing paralysis. The majority of the cases exhibiting improvement are being given the recognized orthopædic treatment.

II. Final Report on 158 Cases not Included in the Paper of McEachern *et al*

The data obtained concerning these cases during the epidemic are insufficient to permit a similar detailed analysis. This group can, therefore, only be briefly dealt with. Data concerning 83 of these cases permit some attempt at analysis, although it is uncertain whether, in those who received serum, the serum was given in the pre-paralytic stage or later. The analysis is presented in Table III.

TABLE III.

Contrast of Results in Earlier and Present Reports

Previous Report	*Present Report*	*Serum*	*No serum*
No. of cases showing			
Complete recovery	Complete recovery	24	7
Complete recovery	Subsequent paresis or paralysis	0	0
Complete recovery	Subsequent death	0	0
Paresis or paralysis	Complete recovery	6	5
Paresis or paralysis	Paresis or paralysis	6	35
Paresis or paralysis	Subsequent death	0	0

These results are in general agreement with those in Table II. All of the 6 and 23 of the 35 now exhibiting paralysis, in the two respective groups, are showing definite improvement. It should be noted that the majority of these are also receiving orthopædic treatment.

The remaining 75 cases include those of which only the present result has been ascertained, and also those cases in which we have no certain information as to whether serum was administered or not. The available data are given in Table IV.

TABLE IV.

Third Group of Cases

Complete recovery	27
Present paresis or paralysis	45
Deaths (reported subsequent to the earlier report)	3

Hence the final statement concerning the 435 cases of poliomyelitis in the Manitoba epidemic is as shown in Table V.

TABLE V.

Complete recovery	143
Present paresis or paralysis	129*
Deaths	40
No present data	123
Total	435

* Including one case which died of pneumonia.

SUMMARY

A late analysis of the data concerning the Manitoba poliomyelitis epidemic of 1928 shows that of 272 cases, concerning whose present or recent condition it has been possible to obtain reasonably accurate data, 143 have completely recovered, and 128 still show some degree of paresis or paralysis (one other in the latter group died of pneumonia).

The total number of deaths attributable to the epidemic is 40. No present information is available concerning 123 cases. Since for most of these cases the Committee's circular was not returned by the postal authorities (indicating that it had been properly delivered) nor by the parents, it is not improbable that the majority of them completely recovered.

Careful analysis of the group previously specially investigated to ascertain the effect of convalescent serum treatment yields data confirming the conclusions previously drawn, that this treatment seems beneficial when given in the pre-paralytic stage.

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INTRATRACHEAL ETHYLENE-OXYGEN ANÆSTHESIA*

BY HAROLD R. GRIFFITH, M.D.,

Montreal

AT the Montreal convention of the Eastern and Canadian Societies of Anæsthetists in 1926, Dr. McMechan gave a report on intratracheal nitrous oxide-oxygen anæsthesia as practised by Magill and others in England. This work appealed especially to us in Montreal, since for several years intratracheal ether anæsthesia had been our routine procedure in adult nose and throat cases. So Stewart[1] at the Montreal General Hospital began intratracheal nitrous oxide in a few selected cases, and since then he, Hargrave,[2] and others[3 & 4] have continued and developed this method.

For four years at the Homoeopathic Hospital of Montreal I have been using ethylene, and I have grown to appreciate its value. Therefore after a few intratracheal nitrous oxide administrations, I felt I could safely substitute ethylene with its unquestioned advantages. We have thus evolved a technique for intratracheal ethylene-oxygen anæsthesia which has proved most satisfactory in a comprehensive series of cases, and which I feel has enabled us to anæsthetize certain patients with a new degree of safety and comfort.

We have used intratracheal ethylene successfully in the following types of cases:

1. Tonsillectomies in both adults and children, when ether was for some reason contra-indicated, or when the patient was anxious to avoid the discomforts of ether anæsthesia. In some cases the operation lasted for more than an hour, with the patient satisfactorily relaxed.

2. Mastoidectomies. We had a series of cases last winter in small and very frail children following an epidemic of measles in an orphans' home. Gas seemed the anæsthetic of choice, and intratracheal ethylene enabled us to bring these children through long operations with a minimum of danger. Respiration is delightfully under control, there is no choking with mucus, and the anæsthetist is well out of the surgeon's way. At the other extremity of age, we recently operated on a man of seventy with an acute and extensive mastoid infection. He was an alcoholic with myocardial degeneration, and came to the operating room with no preliminary morphine. I regarded him as an extremely poor prospect for anæsthesia. However I was able to keep him perfectly relaxed for over two hours with intratracheal ethylene, and no more ether than a few breaths during the induction. He left the operating room wide awake, and has made an astonishingly rapid recovery.

3. A series of septum, antrum, and other sinus, eye, face, and brain operations. Our surgeons usually prefer to do their septa under

* Read before the joint meeting of the Eastern and Canadian Societies of Anæsthetists, Boston, October 9, 1928.

local anæsthesia, but in cases where the patient has insisted on being put to sleep, they have told me that there is much less congestion of the mucous membranes with intratracheal gas than with ordinary ether anæsthesia.

4. Thyroidectomies. Intratracheal anæsthesia is here favoured by our surgeons because of the impossibility of tracheal collapse, and because the firm catheter forms an excellent landmark in the larynx and the trachea. My experience has been that ethylene is more satisfactory in these cases than nitrous oxide, and with it I have had a patient well relaxed and in good condition for as long as three hours, without once resorting to ether.

TECHNIQUE OF ADMINISTRATION

The patients are usually prepared with morphine ¼ grain and hyoscine 1/150 grain one hour before operation, and another hypodermic of morphine 1/6 grain half an hour later, but in this I follow no set formula, and many of our cases, especially children, have had no preliminary hypnotic medication.

Anæsthesia is induced in the usual way with nitrous oxide oxygen, using a little carbon dioxide if necessary. Then I switch to ethylene for more complete relaxation, occasionally adding a few breaths of ether. The head is thrown back into position for intubation, then the face mask is removed and the larynx exposed as quickly as possible with a Jackson speculum of suitable size. This is really the only part of the technique which requires any particular dexterity; and skill comes only with experience. I would not advise an anæsthetist to attempt this procedure under gas until he has become accustomed to using the direct laryngeal speculum with the patient more completely relaxed under ether. Great care must be taken not to damage the posterior wall of the pharynx, and the upper incisor teeth may be broken if leverage is used instead of the proper lifting movement. If the larynx is not successfully exposed at once, it is unwise to struggle with the patient half awake, but one should return to the face mask, and try once more as soon as the patient is again relaxed.

Then when the larynx is in view, a silk or lisle catheter of the proper size is introduced, and the end pushed down to about three centimetres above the bifurcation of the bronchi. In the average adult this will be about 22 centimetres from the teeth. In the meantime an assistant has turned a two-way valve on the gas machine, which directs the gas into a small nasal bag to which is attached an ordinary irrigator nozzle. This is at once inserted into the end of the catheter projecting from the mouth, and the anæsthesia continues. A mouth-gag is adjusted to prevent any possibility of the patient biting the intratracheal tube, the speculum is then removed, and the patient is put in position for the operation.

The catheter is of such a size that it will nearly fill the trachea. I use all sizes from F16 or F18, for infants, up to F32, which is the largest size I have been able to obtain. Stewart uses an ordinary rubber rectal tube. It is very important that the catheter be large enough to prevent inhalation around it of much air. On the other hand, a catheter that is too large may irritate the larynx, especially in children.

The patient should do a good deal of rebreathing into the small rubber bag to which the catheter is attached. I usually keep my hand on this bag, and thus even when the patient is completely covered, I can follow the depth and rate of respiration and can control the intrathoracic pressure. The bag may be greatly distended before the pressure becomes dangerously high, giving one plenty of warning to reduce the flow of gases. But as an extra precaution I have a mercury manometer on the machine, set to blow off at twenty millimetres. I feel that the use of this small rubber bag is a very great advantage in this method of anæsthesia.

During such an anæsthesia the patient's respiration is always under control, with no possibility of obstruction. One can obtain an almost immediate response to carbon dioxide or oxygen stimulation when necessary. Relaxation with ethylene is more satisfactory than with nitrous oxide: the patient is awake immediately after the operation, and nausea seldom occurs. The method is extremely economical, since the consumption of ethylene during an average administration is from three and a half to four litres (or less than one gallon) a minute. With small children I often use as little as one and a half litres a minute.

I have kept in mind constantly the possibility of explosion with ethylene, but so far after four years and about twelve hundred administrations we have had no accident in our hospital. We

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use the Foregger "Metric" and the "Safety" machines, both of which are of the type which contains water. In order that the gas may flow only over a wet surface, I introduce also a few drops of water into the rubber tubing and the rebreathing bag. I have never used any grounding device.

The experimental work of Hornor and Gardenier,[5] and of Poe[6] and others has demonstrated that we may maintain in the machine and bag an anæsthetic mixture of ethylene and oxygen which is entirely outside the range of explosibility. I start and finish my anæsthesia with nitrous oxide instead of ethylene, and the addition of carbon dioxide still further reduces the explosion hazard. On the other hand, the exhaled gas soon becomes so dilute in a well ventilated room that it will not explode, and I do not hesitate to run a properly shielded electric suction machine within a few feet of the patient. However, there must always be a certain region near the patient's face where the exhaled gas is just the right mixture for explosion, so we make it a rule never to allow the use of a cautery or other open flame or spark in the operating room during the administration of ethylene, and we never use this gas except under the carefully supervised technique of the operating or delivery rooms.

We have used intratracheal ethylene for patients of all ages between fourteen months and seventy years. It seems to me to be an almost ideal anæsthetic method for small children, provided one is careful not to damage the pharynx with the speculum, and a catheter of exactly the proper size is used. There is no hypersecretion of mucus as with ether, and the respiratory effort is not laboured. The gases are delivered directly into the lungs under a gentle positive pressure, and so the dead space which might be present with ordinary mask administration is entirely abolished. I have never had any resulting pulmonary complications, even in cases with pre-operative respiratory infection. However, in one case of a child of eighteen months there was a sharp temporary laryngitis. This was due to the use of a catheter a little too large.

In conclusion, I would like to express my thanks to those surgeons who have given me the opportunity to develop this method, and especially to Dr. A. W. Furness, on whose oto-laryngological service all our first cases were undertaken.

SUMMARY

1. Intratracheal ethylene-oxygen anæsthesia has been used successfully in a series of nose, throat and ear operations, and in thyroidectomies.

2. The technique of administration is described, and safety factors in the use of ethylene considered.

3. This method seems of special value in operations upon children.

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INTRACARDIAC BLOOD TRANSFUSION. — A. Tzanck reports a case in which a young woman on the verge of death from extreme hæmorrhage was saved by intracardiac blood transfusion. Following an abortion so much blood was lost that the patient became unconscious; she was covered with cold perspiration, the pulse disappeared, the pupils dilated, and one or two sighing respirations were obviously the forerunners of death. In this emergency 650 grams of unaltered blood were injected into the heart, there being no time to determine the necessary type, nor could any vein be found. Quick restoration of colour followed and consciousness returned. The uterus was then plugged, but this caused a slight attack of faintness, which necessitated the further transfusion of 400 grams of blood intravenously, after verification of the blood group. The patient's subsequent convalescence was uneventful. The author recalls the case of this kind reported by Achard, Cournand, and Pichot. (See *Epitome*, March 30th, para. 320.)—Epitome, *Brit. M. J.* Aug. 10, 1929.

CONGENITAL TUBERCULOSIS*

REPORT OF A CASE

BY R. R. STRUTHERS, M.D., AND H. G. MITCHELL, M.D.,

Montreal

THE infrequency of intra-uterine tuberculous infection is well known. Since the first authentic human case of congenital tuberculous disease, which was reported in 1891 by Schmorl and Birch-Hirschfeld, several other cases have been recorded. In 1909 Klebs[1] recognized 25 authentic cases. By 1927, Baldwin, Petroff and Gardner[2] stated that about 60 cases in all were reported in the literature. These were all instances of maternal transmission by way of the placental blood. Scheer[3] emphasized the fact that two different types of congenital tuberculosis have to be distinguished, namely, those with pathological changes in the hepatic porta, placental infection, and those with primary involvement of the respiratory tract, whether through placental infection or perhaps bronchogenous from inspiration of amniotic fluid.

Congenital tuberculosis constitutes, according to Scheer, 5 per cent of infant tuberculosis, being thus of more common occurrence than has hitherto been suspected. Infants with congenital tuberculosis are usually born before term and under weight. The prognosis is not altogether fatal.

Choremis[4] reports the occurrence of tuberculosis apparently congenital and of intra-uterine origin in twin girls (foundlings). When received, the infants appeared normal and sufficiently well developed for their age (3 weeks). The tuberculin test, applied as a routine, was positive. The condition of the children deteriorated rapidly and they died after two weeks or less. The diagnosis in one case was generalized tuberculosis with particular localization in the lungs; in the other case, miliary tuberculosis of the lungs.

It is noted that in the second case the child never had fever, and that at necropsy there were no signs of tuberculosis in the hepatic region; neither liver nor spleen was palpable. Tuberculides were absent in both cases. If they had been present, they disappeared before the children were brought to the institution.

De La Alberca[5] reports three cases in which death at the age of one month, seven weeks, and five months, respectively, was explained by cheesy tuberculous mesenteric glands. No other tuberculous lesions were discovered at necropsy. He remarks that these congenital primary lesions might be found more often if systematically sought for.

Kochmann[6] reports a case which was undoubtedly one of congenital tuberculosis. The infant had been isolated immediately after birth. She had a positive tuberculin reaction on the twenty-sixth day, and a roentgenologically manifest pulmonary focus in the sixteenth week. There were no other clinical signs, except a slight cough and twice a subfebrile temperature. At the date of the report she was 128 days old, had gained 1,600 grm. in weight and 10.5 cm. in length.

Debre and Lelong[7] assert that thorough observation, necropsies, microscopic examinations, and inoculations seem to testify that no contamination with tubercle bacilli is possible by way of the placenta, nor is there inheritance of a tuberculous soil. The doctrine of the inheritance of tuberculosis, they say, is not based on facts but on impressions. They can find no evidence to sustain it.

Calmette and Valtis[8] relate experiments, made in collaboration with Negre and Boquet, in which gravid guinea-pigs were inoculated with filtrates of tuberculous products or cultures. It appeared that the filtrates contained virulent elements able to attack the fetus after having passed through the intact placenta. The fetal lesions were localized almost exclusively in the subhepatic lymphatic glands. Characteristic

* From the Department of Pathology of the Montreal General Hospital.

Read at the Seventh Annual Meeting of The Canadian Society for the Study of Diseases of Children, May, 1929.

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acid-resisting tubercle bacilli were found there. The thinning of the endothelial wall of the placenta at the end of gestation in these animals might favour penetration. This anatomical phenomenon may be less pronounced in the bovine and human species. However, it is probable that intra-uterine contamination of a calf or infant is not an exceptional occurrence. It probably proves rapidly fatal, without any well defined lesions in any organs.

According to Calmette, Valtis, Negre and Boquet,[9] it was demonstrated experimentally that, following the inoculation of pregnant female animals with filtrates obtained by filtering tuberculous pathological products or cultures of tubercle bacilli through Chamberland filters, the fetus may be infected through the placenta. When the fetuses were killed after birth many were found to have pathological foci which contained true tubercle bacilli.

Kochmann[10] states that a mother with open pulmonary and laryngeal tuberculosis bore an apparently healthy child, but the mother died eighteen days after delivery. The child was entirely removed from the mother after delivery. On the 26th day it exhibited a positive tuberculin reaction, and on the 106th day roentgenological pulmonary foci.

Bernard[11] is of the opinion that until further evidence to the contrary has been brought forward, a hereditary infection must still be regarded as playing a negligible part in the etiology of tuberculosis, and that contagion is responsible for tuberculosis in the infant—maternal contagion in the majority of cases; contagion through other people, with whom the infant comes in contact, in exceptional instances. In every case in which an infant born of a healthy mother has become tuberculous, a careful inquiry reveals a tuberculous contact.

According to Opie,[12] "Hereditary transmission of tuberculous infection from parent to child may be regarded as a negligible factor in the spread of the disease. Transmission from mother to fetus by way of the placenta has been described in a small number of well authenticated instances, and has occasionally caused fatal disseminated tuberculosis in early infancy; but this event occurs so seldom that congenital transmission of tuberculosis has been regarded as insignificant. Nevertheless, the opinion that an ultramicroscopic form of the tubercle bacilli which can pass through a porcelain filter penetrates the placenta and infects the fetus in utero has been advocated by Calmette and other French observers. The existence of these filtrable forms of the micro-organism is still uncertain."

The following case report deals with a mother, admitted to the Montreal General Hospital, and her child:

Mrs. F. A. was admitted to the Montreal General Hospital on June 29, 1928, complaining of pain in the left chest posteriorly, sweats, and general malaise. Her illness began in April, 1928, when she suffered from what she considered an ordinary cold. From that time her condition became steadily worse.

On examination, she was seen to be a poorly nourished, fairly well developed, young woman, obviously quite ill. The skin was hot and dry. There was no general glandular enlargement. She had a dry non-productive cough, some dyspnœa, and a slight degree of orthopnœa. Movement of the left side of the chest was limited, and a dull note was obtained on percussion over the left side. The right side was clear to percussion. Grocco's sign was not present. The breath sounds were vesicular over the right side; on the left, broncho-vesicular anteriorly and in the axilla, and absent posteriorly below the fifth dorsal vertebræ. Pulse 104; blood pressure, 104/74. There was no increase of cardiac dullness.

She stated that she was eight months pregnant, and the physical signs corroborated this. On July 1st she went into labour and delivered herself of a small premature female infant. There was no instrumentation. The placenta followed in half an hour.

The mother had two chills the same day. The abdomen became distended with gas, and fluid was first noticed in the flanks. There were no more chills, but the pulmonary condition progressed, with increasing cyanosis and distress. By July 10th there was dullness over both lungs, with showers of crepitant râles in each axilla. The fluid in the peritoneal cavity increased. There was at no time any evidence of meningitis. The temperature was continuously elevated, with daily remissions from 102° F. to 100° F. X-ray on July 5th showed a marked diffuse fine tuberculous infiltration extending over both lung fields. (Fig 1). The clinical diagnosis, supported by the x-ray, was generalized pulmonary tuberculosis, although no sputum could be obtained to search for acid-fast bacilli. She died on July 14, 1928. Autopsy was not permitted.

The birth weight of the baby was 4 lbs. 9 oz. The infant was immediately removed from its mother and sent to the Royal Victoria-Montreal Maternity Hospital. It was put on artificial feedings, and, on account of its prematurity, about eight months, was placed in an incubator, but failed to gain in weight. On the thirty-sixth day of life the temperature rose to 100.4° F. and from then on was almost continuously elevated, usually between 99.4° F. and 100.4° F., but reaching 103° F., a few days before death. On August 13th, aged 42 days, when it weighed 4 lbs. 5 oz., it was transferred to the Montreal Foundling Hospital. Later, the child became dyspnœic and cyanosed. The chest became dull throughout on percussion, with a flat note at the right base. On auscultation fine râles were heard all over the chest. Intradermal injections of old tuberculin in increasing strengths gave negative results. Cerebro-spinal fluid obtained by lumbar

puncture was normal. By September 8th there was evidence of a pneumonic process and an x-ray of the chest on September 10th showed miliary tuberculosis with a pneumonic patch at the right base (Fig. 2). The greatest weight (5 lbs. 15 oz.) was reached the same day (September 10th). The dyspnœa and cyanosis progressed, with advancing physical signs in the chest. The infant died on September 16th, aged 78 days. Autopsy was performed on the same day, twelve hours post mortem.

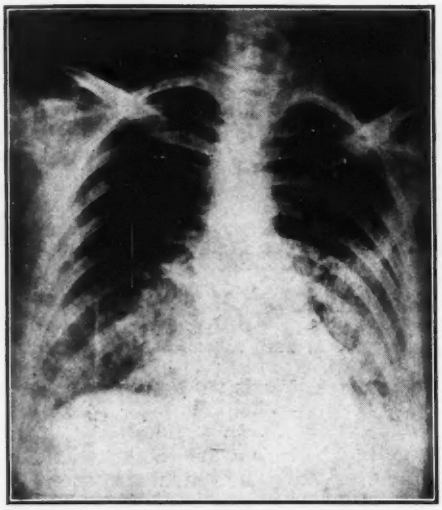

FIG. 1

FIG. 2

AUTOPSY FINDINGS

The body was that of a very emaciated and poorly developed white female infant, 29 cm. in length. The buttocks were excoriated. The peritoneal cavity contained nothing of note. The pericardial sac was normal. There was a slightly excessive amount of clear fluid in the pleural sacs. Both parietal and visceral pleuræ were studded with small greyish tubercles. The lungs were voluminous, light pink in colour, and small firm nodules could be palpated in them. On section the cut surface of both lungs was uniformly involved in a diffuse patchy consolidation of greyish caseous areas, some of which were confluent, varying in size from 0.1 cm. to 1 cm. in diameter. The intervening lung tissue was somewhat œdematous and congested, and a small amount of mucopurulent secretion could be expressed from the smaller bronchioles. The mediastinal lymph-nodes and bronchial nodes were enlarged, some to 1 cm. in diameter, very firm, and on section were yellowish grey and caseous. The heart was apparently normal. The liver was somewhat enlarged, but presented no gross lesion, externally or on section. The spleen was slightly enlarged but presented no gross pathological findings. The kidneys and remaining organs showed no gross lesion. The mesenteric lymph-nodes were not enlarged nor caseous. There was no lesion of the gastro-intestinal tract.

The lungs, microscopically, showed a very extensive tuberculous process, the lesions falling into three general stages, consisting of:

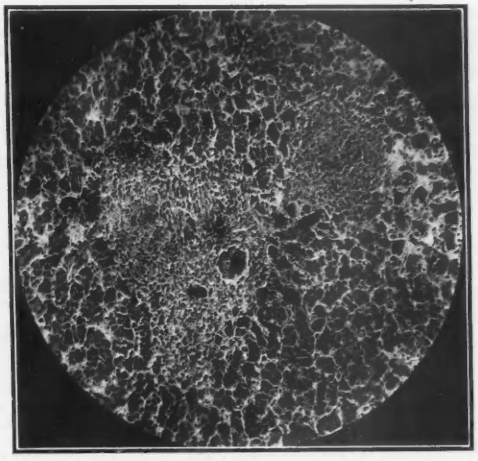

FIG. 3.—Liver showing the oldest tuberculous lesions.

(a) Areas in which the alveoli were filled with catarrhal alveolar cells, small lymphocytes, and endothelioid cells. Tubercle bacilli were extremely numerous. These represented the most recent lesions. (b) Areas where these lesions had coalesced. The central portion had lost its cellular differentiation and staining

characteristics and had become caseous; occasional giant cells were seen. (c) Older lesions showing in addition to the above, reparative changes in the nature of fibrosis. Differential stains showed fibroblastic reaction and the formation of fibrous connective-tissue. The liver was also diffusely invaded by a tuberculous process, consisting of microscopic tubercles. As in the lung, these were of different stages. Some were very recent, while some showed more advanced fibrosis than that found in any other organ (Fig. 3). The spleen showed many microscopic tubercles, but was less generally involved than the liver. The mediastinal glands were the seat of a tuberculous lymphadenitis. Special stains revealed the presence of acid-fast bacilli in large numbers in the tissues of the lung, liver, spleen, and mediastinal glands. The kidneys, heart, thymus, pancreas and adrenals showed nothing remarkable.

Although the placenta was not examined in this case, we feel that the very widespread infection, the estimated age of the lesions, the oldest one being in the liver, the fatal termination of the disease at such an early age, the fact that the child was not even seen by its mother, and the immediate and continuous isolation from probable sources of infection, are sufficient evidence to warrant a diagnosis of ante-natal tuberculous infection.

This case was admitted to the Montreal General Hospital to the service of Dr. D. Grant Campbell, to whom we are indebted for permission to publish it.

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THE LESIONS OF LATENT SYPHILIS.—The lesion of latent syphilis repeats the essential pathology of the hard chancre and of the secondary and tertiary lesions of the active stage of syphilis, in that it is predominantly vascular and perivascular, and that the infiltrations are derived from the proliferation of cells *in situ*. Each localization of the spirochæte leads to the production of what is essentially a miniature chancre. The presence of plasma cells and lymphocytes in the tissues in the form of localized perivascular infiltrations may be taken as the criterion for the presence of *Spirochæta pallida*. The organism, therefore, persist in the tissues, producing slight lesions leading eventually to fibrosis and atrophy of the parenchyma. Clinical symptoms will arise only when this atrophy and fibrosis reaches such a degree that functional disturbance results. In the average case in the male this functional inadequacy appears first usually in the cardio-vascular system, and death from latent syphilis is most frequently due to cardiac insufficiency. There are, however, especial organ susceptibilities to the localization of the spirochæte; in one individual the central nervous system, in another the liver, in a third the adrenals, etc., may bear the brunt of the latent infection, so that the clinical picture and the manner of death may vary greatly, according to the organ or tissue chiefly involved.

I have never seen at necropsy a case of perfectly healed syphilis. Search, often prolonged, always reveals active latent lesions in aorta, heart, or other organ. This is as true of cases treated in the modern manner as it is of cases treated with the old mercurial method. If any difference results in the two methods of treatment it would appear to be in the more frequent occurrence of chronic hepatitis in cases treated by the arsenical method. What the treatment accomplishes in either case is the more rapid reduction of the average active case to a stage of lateney. There is no evidence pathologically that the case of syphilis ever becomes wholly free from spirochæates. The latency of the infection may last throughout the individual's life; or at any time exacerbations may take place, and the disease arise above the clinical horizon. What determines these renewals of virulence on the part of the spirochæte, whether it be due to a changed quality on the part of the organism or to changes in the resistance of the body, we do not know. The possibility of such a clinical renewal of activity on the part of the spirochæte is always a possibility hanging over the head of the individual who once acquires this infection. Even if the disease never again produces a clinical outbreak, the relatively immune syphilitic will nevertheless develop various functional inadequacies as the price of the latency of his infection. These minute local infiltrations of plasma cells and lymphocytes represent the processes of a local tissue immunity. With time this immunity mechanism in itself becomes dangerous to the individual through the functional inadequacies which it may eventually produce. Whether a consistent five-year period of treatment would finally rid the body entirely of spirochætes I cannot say, for in my material there have been no cases that have been under continuous treatment for that period of time. The fact remains, however, that in syphilitics accorded what has been regarded by the clinician as thoroughly satisfactory treatment, with complete clinical cure, latent lesions of syphilis still present themselves on microscopic examination of the necropsy material derived from such cases.—Prof. A. S. Warthin in *Brit. M. J.* **2:** 236, Aug. 19, 1929.

SEPARATION OF THE LOWER FEMORAL EPIPHYSIS*

BY W. J. PATTERSON, M.D., F.A.C.S.

Assistant Surgeon, Royal Victoria Hospital and the Shriners' Hospital for Crippled Children, Montreal

SEPARATION of the lower epiphysis of the femur is not a common accident at the present time, but nevertheless occurs sufficiently frequently, and is of such importance when it does happen, that it is worthy of serious consideration.

The present generation can hardly appreciate the common name for this trauma because of the rapid replacement of horse and cart by the automobile, but it is called the "cart wheel" fracture, owing to the fact that it so frequently resulted from catching the leg between the spokes of a wheel in attempting to climb on or off a wagon. The condition is produced by the application of force with the knee in hyper-extension and also rotation. This explains why in so many of the cases the epiphysis is displaced anteriorly and upwards as well as somewhat to one side. Toboggan and automobile accidents, and any accident in which the body weight is thrown against the extended knee with the lower leg fixed and acting as a fulcrum, are also to be listed as causes of this fracture.

The age at which this most often occurs is between eight and fourteen years, for while the lower femoral epiphysis is present at birth and does not unite until the age of twenty years, it is during this period of between eight and fourteen that the presence of an ununited epiphysis and the stress and strain due to the physical activity so marked at that age, form an ideal combination for the production of such an accident. With each succeeding year the liability lessens, owing to the nearer approach of union, and the better protection afforded by the growing individual both from a physical and mental viewpoint.

Naturally, the accident has occurred more frequently in boys than in girls in the past, but modern tendencies in life will shortly equalize the figures. The two cases to which I wish to refer later on were girls, and both resulted from automobile accidents.

The points which I wish to emphasize in this short article are as follows:—

1. The serious nature of the injury and the possible complications, such as injury to blood vessels and nerves and to growth.
2. The methods of treatment recommended in text-books.
3. A simple method of reduction and treatment.

The injury is serious because it is one which implicates the knee joint, either directly or indirectly, and in addition is very likely to cause damage to the blood vessels and nerves in the popliteal space. In the simple separation of the epiphysis in a transverse direction the joint is not directly involved, except by the wrench and strain put upon its capsule and ligaments before separation takes place. This always results in a marked effusion into the joint and sometimes in a hæmarthrosis. But occasionally, the epiphysis, in addition to being separated in a transverse direction from the shaft of the femur, is also split or fractured in a more or less longitudinal direction. This fracture then, of course, involves the joint directly, and, commensurate with the degree of displacement and subsequent replacement, forms a serious complication with regard to future function of the joint. The diaphysis also may be fractured, as in one of my cases.

The epiphysis being displaced anteriorly, usually as the result of the lines of force causing the separation, it follows that the lower end of the shaft of the femur is displaced backwards into the popliteal space and here constitutes a menace to the blood vessels, and especially to the nerves, so that an equinus foot or an equino-varus foot is quite frequently seen. The nerve is not often torn across but is subjected to pressure, and if this is relieved

* Read at a meeting of the Montreal Medico-Chirurgical Society on April 5, 1929.

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the power will quite frequently return. During the period of paralysis, however, the tendency to deformity is present, and, owing to the concentration of attention upon the main condition about the knee joint, this condition may be overlooked.

Another serious danger in this accident is that of tetanus. Practically all these accidents are the result of out-of-door, and, chiefly, street trauma. There is very frequently injury to the skin and soft tissues, and it should be the rule that those cases showing any possibility at all of infection be given antitetanic serum. Moreover, about 50 per cent of these fractures are compound.

The last danger to be referred to is the possibility of interference with growth. This, in my opinion, has been exaggerated but it is not to be ignored. Proper and early replacement of the separated epiphysis will go a long way to obviate this complication. The atrophy which results from nerve injury should not be confounded with the loss of growth due to interference with the growth line by separation of the epiphysis, but both of these conditions together with the circulatory disturbances must be kept in mind, that their consequences may be guarded against.

Even the most recent text-books on fractures state that the epiphysis should be replaced by certain methods and maintained in position by flexing the knee and application of plaster from the toes to the groin. Some advocate open reduction, others the closed manipulation method. I am opposed to the open method, first, because I believe it is seldom if ever necessary; and, secondly, because the skin is practically always bruised and abraded, and sometimes torn, and the danger of infection is great. Practically every case can be reduced by manipulation with the knee flexed, and with downward traction on the upper portion of the tibia, with counter traction by an assistant in an upward direction on the flexed femur. But the important point which I wish to make is that it is not necessary to maintain fixation in the flexed position once the reduction has been accomplished. The knee may be extended and the application of a Thomas splint forms an excellent method of fixation. It is especially valuable in those cases where there has been much bruising of the skin, or where wounds are present which require dressing. In those cases where the separation of the epiphysis is complicated by longitudinal fractures it is wise to make the reduction under the fluoroscope if possible, and with this aid the fracture can be much more effectively dealt with and better coaptation secured. Once the reduction of the separated epiphysis is secured there is little danger of its relapsing with the leg in a fully extended position, as long as movement is prevented. This greatly shortens the period of disability and does away with that painful process of straightening a knee which has been held in flexion in plaster for some weeks after being subjected to severe trauma. The leg should be kept in the Thomas splint for five to six weeks, or a plaster-of-Paris cast may be substituted about two weeks after reduction.

Movement of the patella and contraction of the quadriceps should be begun early. Weight-bearing should not begin under six weeks, but walking without weight-bearing should be encouraged after four weeks.

CASE 1

The first case I wish to present is that of a little girl nine years old, who, on August 5, 1928, was riding in an automobile which was struck by a train. She was thrown out, and sustained numerous injuries including a Potts fracture of her left ankle, and a separation of the lower femoral epiphysis of her right leg. She did not come under my care until August 15th, and in the meantime no attempt had been made to reduce her fractures. Her right leg was tremendously swollen, the knee was greatly enlarged and there was marked deformity. The skin was badly damaged about the knee and thigh, but there were no deep wounds. Antitetanic serum was given, and under an anæsthetic, the leg was manipulated by the method already mentioned and good reduction obtained. (See Figs. 1 and 2). A Thomas splint was applied. Perfect function has resulted in the knee. There was, however, injury to the popliteal nerve with subsequent equino-varus deformity. The nerve recovered in due time, but tendon lengthening was necessary for the equinus deformity. No shortening of the leg resulted. Full function of the knee is present. It is interesting to note that reduction was accomplished by closed manipulation, eleven days after the separation, and that an open reduction would have been a very grave undertaking on account of the skin condition and danger of infection.

CASE 2

This second case was a girl of five years who also was the victim of an automobile accident, the details of which, however, are not available. She sustained, in addition to the separation of the epiphysis, a fracture of the diaphysis on the internal side. This was wedge-shaped and showed considerable displacement and rotation. There was marked bruising of the soft parts. On the day of the accident reduction was accomplished under the fluoroscope, the only difficulty experienced being due to the rotation of the diaphyseal fragment. (See Fig. 3. However, fairly good approximation was secured as is seen in Fig. 4. The leg was put up in a Thomas splint in full extension, and in two weeks' time this was re-

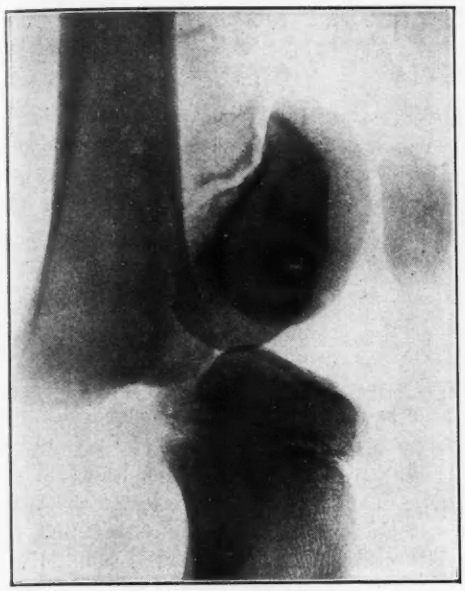

FIG. 1

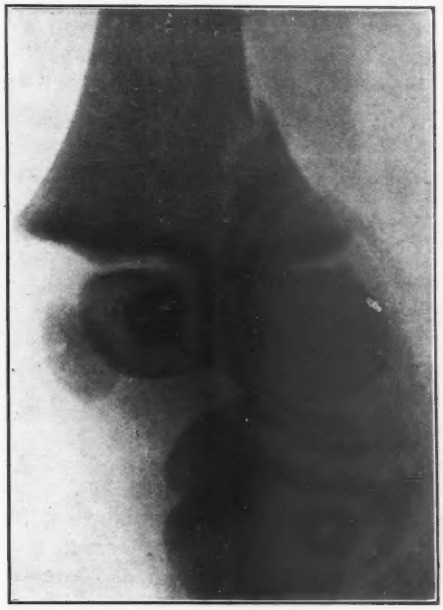

FIG. 3

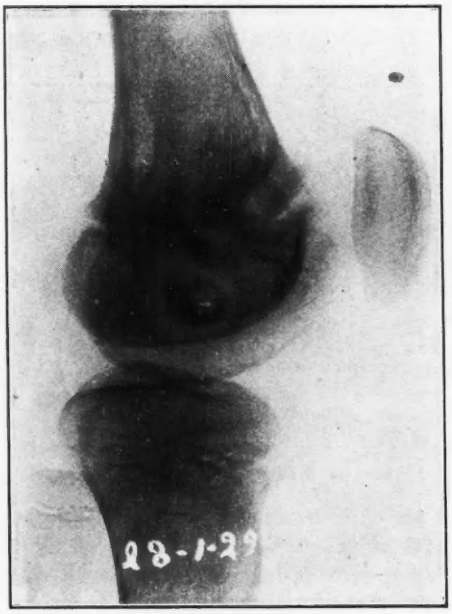

FIG. 2

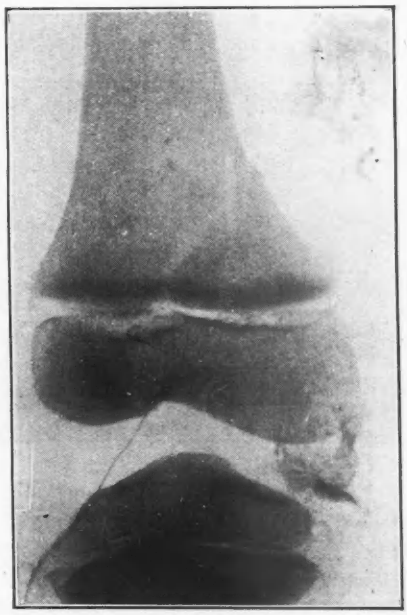

FIG. 4

placed by plaster in order to facilitate the discharge of the patient from hospital.

Full range of movement resulted in the knee and there is no shortening.

The following comment was made at the meeting by Dr. W. G. Turner.

These two cases really illustrate very clearly the anatomical replacement, and the result, of course, justified the procedure in replacing the epiphysis. I feel very strongly that any injury that can be put in a straight line should be put in a straight line.

The second of these cases was a very difficult one, as there was so much delay in proceeding with the operation. The accident happened out in the country, and the patient was only brought into town a week or ten days after, in a very bad condition. The reduction was done, of course, in a straight line, as it should be whenever possible, as everyone knows who has had the trouble of trying to straighten out a limb after a long treatment. I think these two results are very striking and brilliant successes.

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Case Reports

THREE CASES OF ENDOMETRIOSIS

BY S. E. C. TURVEY, B.A., M.D., AND WILLIAM BOYD, M.D., M.R.C.P. (ED.), F.R.S.C.,

Winnipeg

Endometriosis has become an increasingly common finding at operations, and the following cases are reported chiefly for the rarity of certain features they present.

CASE 1

A female, age 29, married, two months pregnant. She was operated on following three definite attacks of pain and tenderness in the right iliac region with nausea and vomiting. At operation, the appendix was not diseased. A unilocular cyst of the right ovary was found, the size of a large pea, which contained hæmorrhagic, chocolate-coloured fluid. Microscopically, it was an endometrioma. And the remarkable feature was that it showed a decidual reaction, with an abundance of large decidual cells.

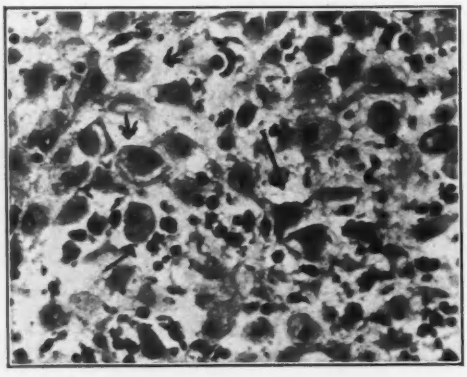

FIG. 1.—*Case 1.*—Decidual cells.

CASE 2

A female, age 34, complained of pain in the right iliac region, dull and aching, but occasionally sharp enough to cause nausea, though she never vomited. An indefinite tender thickening could be palpated to the right of the uterus. At operation, a corpus luteum cyst of the right ovary, into which hæmorrhage had occurred, was found. The appendix was removed as a routine measure. A small nodule, the size of a small pea, was palpable, under a slightly thickened serosa, at the tip of the appendix. Microscopically, this nodule was a typical endometrioma.

CASE 3

A female, age 30, married. She had had a ventrofixation operation six months previously; the scar had never completely healed, and the condition was diagnosed as a post-operative sinus, due to two silk ligatures found in the wound. The sinus, when injected with an opaque solution, was shown only to extend beneath the skin. The sinus was excised. Microscopically, endometrial tissue was found, suggesting an endometrioma.

The interest of the first case is chiefly due to its value in proving Sampson's theory of origin from the endometrium proper, for the decidual reaction is peculiar to that tissue. Only two similar cases have been found in the literature of such an occurrence.

FIG. 2.—*Case 2.*—Endometrioma in wall of appendix.

The second case is of interest because of the unusual situation. The third case would seem rather to support the German view that endometriomata may be due to a peritoneal metaplasia.

Acknowledgments are due to Drs. B. J. Brandson, J. E. Lehmann and A. M. Campbell for permission to use their cases; and to Miss L. Nason for preparing the photomicrographs.

A CASE OF ACUTE BACTERIAL ENDOCARDITIS*

BY A. P. HART, M.B., AND
L. N. SILVERTHORNE, M.B.,

Toronto

The following case of bacterial endocarditis presented interesting clinical symptoms.

History.—Barbara McI., aged 13, of Canadian parentage, was admitted into the wards of the medical division of the Hospital for Sick Children, on March 24, with a diagnosis of rheumatic carditis, rheumatic endocarditis, acute bacterial endocarditis, encephalitis.

The family history was negative. She had had measles in 1919; scarlet fever in 1922; whooping cough in 1921; and two attacks of rheumatic fever in the last 2 years, the first of which was quite severe.

The parents also stated that because of the rheumatism she had been kept at home for the past six months, but had not lost weight and was apparently perfectly well.

She had been perfectly well until two weeks prior to admission. At this time she complained of pain in the right ear for two or three days; there was no discharge. At the same time she became tired and listless with a poor appetite. One week later the mother noticed she was quite feverish and a physician was called. For the next few days it was noticed that her urine was darker in colour than usual and there was a slight frequency. During this week she vomited a small amount of clear fluid two or three times daily. Three days before admission she became drowsy and complained of slight headache. The drowsiness increased until the time of admission.

Examination on Admission.—On seeing this child in the admitting room, the first impression was that she was suffering from some form of encephalitis. She was acutely ill with a temperature of 105°, with a mask-like facial expression, very drowsy, lethargic with a weak encephalitic cry like that of an extremely ill infant.

The eyes reacted to light, and the pupils were regular and equal. The lower conjunctival membrane on the right side showed a shower of petechial hæmorrhages. The eyegrounds revealed a number of retinal hæmorrhages with white central areas which were approximately ⅛ cm. in diameter. The drum membranes of the ears showed no sign of past disease.

Petechial hæmorrhages were seen on the skin, distributed diffusely over the whole anterior part of the chest, with some on both arms and on the back. These increased in number while the child was in the admitting room.

A few petechiæ were found on the buccal mucous membrane and a shower of white-topped embolic hæmorrhages was seen on the soft palate. The throat was the seat of diseased tonsils. The spleen was definitely palpated (in the admitting room). The chest showed nothing of note.

No definite cyanosis was present but the colour was pale, not the "café au lait" so often described. The whole præcordium heaved with the heart beat. Percussion revealed a greatly enlarged heart, the left border in the 3rd interspace was 6 cm. out; in the 5th interspace it was 10 cm. out. A long blowing systolic murmur was present in the mitral area, propagated to the axilla.

Nervous System.—The child was in a state of mental stupor with a mask-like facial expression. On testing the cranial nerves a palatal paralysis was noted. Pain was complained of on extreme flexion of the neck. Kernig's sign was positive. The knee jerks were hyperactive. Long continued clonus was obtained at both ankles. Plantar stimulation gave an extensor response on the right side.

Laboratory findings.—The urine showed a slight trace of albumin. Red blood cells were 5,920,000 per c.mm. with a hæmoglobin content of 80 per cent. The white blood cells numbered 34,000 per c.mm. with 82 per cent polymorphonuclear leucocytes. One capillary resistance test was negative. Bleeding and clotting times were normal. Platelets were 200,000 per c.mm.

Blood culture showed the presence of *S. viridans* at the end of 48 hours.

Cerebrospinal fluid.—On admission this was clear, under slightly increased pressure, with a count of 990 cells, 82 per cent lymphocytes, a

* From the wards and laboratories of the Sub-Department of Pædiatrics, University of Toronto and of the Hospital for Sick Children, Toronto, under the direction of Alan Brown, M.B.

Read at the seventh annual meeting Canadian Society for the Study of Diseases of Children, Hamilton, May 27, 1929.

positive Noguchi test and film formation in 24 hours. On March 28th the fluid was slightly yellow in colour but clear, with 550 cells, 60 per cent lymphocytes, and still with a positive Noguchi. Culture of this fluid showed a growth of *S. viridans*.

Course in Hospital.—The temperature ranged between 102° and 105°. The child progressively became more drowsy and in the last 24 hours developed a marked spasticity of the arms, holding them in a flexed position. She gradually became comatose and died at 12.40 a.m., March 29, 1929.

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On opening the thorax the pericardium showed petechial hæmorrhages on both parietal and visceral surfaces. There was no pericarditis. The heart was definitely enlarged, measuring 14½ x 10 grm. A coronary embolus was seen in the arterial wall over the left ventricle. The colour of the myocardium beyond this embolic mass was pale and it was of a softer consistency. The wall of the right ventricle showed no signs of active inflammatory change. The left auricle appeared enlarged and on its upper medial surface there was a mural thrombus about 1½ cm. in diameter. This thrombosed ulcerated area was raised above the surface of the auricular wall. It was quite friable and small pieces were broken off. The free margins of the mitral valve were studded with a few scattered fresh, firm, yellowish vegetations. Similar lesions were noted on the tricuspid valves. They were conglomerate and the largest was the size of the head of a pin. The valves all appear to be thickened toward the base and were of a whiter colour than normal. Microscopically, the picture of the heart as a whole was that of a bacterial endocarditis engrafted on an old rheumatic condition.

The liver showed a chronic passive congestion. The spleen and kidneys showed the presence of many petechial hæmorrhages.

The spleen showed a number of small infarcts surrounded by zones of leucocytic infiltration outside of which was a zone of hæmorrhage. In the kidneys some of the glomerular tufts were plugged with emboli. Scattered throughout the interstitial tissue was seen a moderate degree of lymphocytic infiltration.

Sections cut through various areas of the brain, both cortex and medulla, showed the presence of small embolic lesions. In places the lesions were hæmorrhagic. In addition to these embolic lesions there was a low grade meningitis with increased fluid in the pia arachoid space.

COMMENT

Although the literature is extensive in its report of cases of bacterial endocarditis in adults, most authors agree that this malady is a rarity in childhood. Needleman[1] describes the symptomatology in an excellent manner and points out the rarity of the disease in children. This author also believes that small multiple cutaneous emboli are pathognomonic of bacterial endocarditis. Schlesinger[2] also mentions the fact that bacterial endocarditis is uncommon in childhood. He states that pericarditis is a rarity in bacterial endocarditis and yet is found commonly in rheumatic affections of the heart. This fact, along with the uncommon finding of bacterial endocarditis in children, is evidence against bacterial endocarditis being a malignant form of the rheumatic infection. Rost[3] draws attention to the incidence of rheumatic heart disease as the chief predisposing factor to bacterial endocarditis and claims that all statistics endorse this statement. In his series of 12 cases of bacterial endocarditis, 10 had an early rheumatic fever and a rheumatic carditis which was verified at autopsy. In 9 of Rost's cases a nonhemolytic streptococcus was obtained from the blood culture and *B. influenzæ* in one. This author states that the pathological findings are identical with those in adults. He draws attention to the white-centred petechiæ occurring on the conjunctival mucous membrane; this finding was present in the case under discussion. An emphasis is laid on cerebral lesions, which was the cardinal clinical finding in this child, noted on admission. Rost also points out that in his series the cause of death was most often cerebral embolism. Another finding similar to the case presented was the presence of petechiæ in the oral cavity. Blumer[4] in a very thorough discussion of bacterial endocarditis contributes some interesting information. He mentions petechiæ occurring in crops, especially on the conjunctival mucous membrane. Especially interesting is his discussion of the nervous mani-

festations. It will be noted under our laboratory findings that the cerebrospinal fluid was clear, with a cell count of 990, lymphocytes predominating and film formation in 12 hours. From this finding we had thought of the possibility of tuberculous meningitis since some authorities place a great deal of diagnostic import on the film formation in tuberculous meningitis. However this was not the case, as *S. viridans* was isolated from the spinal fluid. Blumer states that this organism has occasionally been found in this fluid. Blumer also draws attention to the retinal changes and in his article mentioned "oval hæmorrhages and miliary white foci" occurring in the retina, which was part of the picture in our case.

White[5] in an article on endocarditis in early childhood states that although endocarditis in infancy is rare, yet it is an entity and more often of a septic nature than rheumatic. Oille, Graham and Detweiler[6] describe a case of streptococcal bacteræmia in endocarditis, and although the usual clinical signs of meningitis were absent they obtained a Gram-positive diplococcus from a turbid spinal fluid. Blood cultures were positive for *S. viridans* in this case. Smith, F. J. *et al*[7] also cite a case of bacterial endocarditis with meningeal signs in which a tentative diagnosis of syphilitic meningitis was given; later, they recovered *S viridans* from culture of the spinal fluid. Antimeningococcic serum was given in this case, but they attribute the clearing up of the meningeal symptoms as much to drainage as to the nonspecific effect of the serum.

CONCLUSIONS

1. A case of bacterial endocarditis is reported, embodying some extremely interesting clinical findings in a female child 13 years of age.

2. There was an old history of rheumatic infection.

3. Encephalitic symptoms were the outstanding features in the case, *i.e.*, lethargy, with weak encephalitic facies and cry. From the film formation in a clear spinal fluid tuberculous meningitis was suspected, but *S. viridans* was recovered from the culture of the spinal fluid.

4. Petechial hæmorrhages, a palpable spleen, enlargement of the heart with a systolic murmur, and the recovery from the blood of *S. viridans* were the main clinical findings.

5. Autopsy revealed petechial hæmorrhages in the heart, brain, skin and mucous membranes, with embolic manifestations in the heart and brain.

6. Finally, we find that bacterial endocarditis occasionally develops in children and that one should always suspect it in an extremely ill child with a cardiac lesion.

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A FATAL CASE OF SUSPECTED BRUCELLA ABORTUS INFECTION

Ontario Hospital, Whitby, Ont.

M. L., female, single, aged 22 years.

Family History. — Very little information could be obtained. The patient was a Barnardo Home girl and had never known her parents.

Personal History.—She came to Canada from England when about the age of 12 and had worked as domestic in a physician's home since that time. She had always enjoyed good health, although "nervous", and two years previously had had a "hysterical spell" in which she thought she was going to die. She made a good recovery after a few days in bed.

Present Illness. — She was admitted to the Ontario Hospital, Whitby, on December 19, 1928. Until two weeks previously she had been in her usual health, although out late nearly every night rehearsing for an amateur theatrical production in the church. She took her part in the play conscientiously; the next day was tired and dull, was unable to do her work, was confused and depressed at times. She was put to bed; her temperature was normal and there were no physical signs. When seen a week after the performance she was lying in bed, staring at the ceiling, and answered questions with difficulty. She said God wanted her to do some special work for Him and she thought she ought to die. She was kept at home a few days longer but there were periods of excitement and crying, along with stupor and depression.

On admission to hospital she was confused,

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agitated, and difficult to keep in bed. Temperature, 99.1°. There was a gradual increase of temperature each day until December 23rd, when it became definitely of septic type with fluctuations, from 99° to 105°. The pulse became weak and rapid (120 to 140). White blood cells were about 8400. The tongue was heavily coated; an acne-like eruption on chest and back; lungs clear; no cardiac murmurs; no neurological signs. On the 24th and 25th of December there were infrequent liquid yellow stools. Blood culture was negative from two laboratories. Agglutination tests were negative for *B. typhosus* and *paratyphosus*. *Brucella abortus* agglutinated 1 to 80. The patient died on December 25, 1928. Autopsy showed moderate congestion of lungs but no other gross pathological state. Permission to examine the brain was not granted.

DISCUSSION

Several conditions were suspected before the Public Health Laboratory returned the agglutination test as above. While the patient was at home, dull, depressed and with hallucinations, dementia præcox was suggested, especially in view of the absence of physical signs or symptoms, and the history of a shut-in, seclusive, day-dreaming personality. When fever developed a week before death, and a spotty rash on the chest, many of which spots looked like vesicles, the question of smallpox or chickenpox came up. We were informed, however, that the eruption had been present in a mild form for a long time on the back, but not on the chest. Typhoid fever was thought of, especially with the appearance of liquid stools and the relatively low white blood count. Opposed to this diagnosis, however, were the rapid pulse and normal-sized spleen with no typical rose spots. The blood was cultured to see if it might yield an organism, as several similar cases have come to our experience in past years where the blood revealed the presence of *streptococcus*. *Brucella abortus* was not even thought of and would not have been diagnosed had not the Public Health Laboratory made the test for this organism. When this report was sent to us, we enquired if the patient had anything to do with cattle and learned that the family kept a cow for their own use and it was one of the duties of the patient to milk it. The milk was not pasteurized. A sample of blood and milk from this cow were sent for examination, but neither showed the presence of this organism. The source of the infection has, therefore, not been discovered.

The presence of such severe physical signs, with a fatal termination, might indicate that agglutination of *brucella abortus* should occur in higher dilution than 1 to 80. For this reason we refer to the case as a suspected infection with this organism.

ENDOMETRIOSIS.—J. V. Meigs believes that endometrioma of the abdominal wall is not an infrequent occurrence, and that it is probably a preventable lesion; he reports four cases of this condition. Aberrant endometrium may be found in many regions in the pelvis and in a few outside it. It is frequently seen in the uterine wall, the ovary, and the recto-vaginal septum. The condition also occurs in many other areas of the pelvic peritoneum, the tubes, the sigmoid, the appendix, the umbilicus, and occasionally in the inguinal canal and vulva; lesions have also been found in abdominal scars. The etiology of all these growths is probably the same. They are likely to be due to transplantation of endometrial tissue either from the uterus or ovarian hæmatomas, or from growths from "rests" of the Müllerian or Wolffian bodies in the pelvis which have been stimulated into activity by some unknown substance. This excitant may be the ovarian secretions, the menstrual blood, or some other substance. A typical endometrioma is a firm, hard tumour without capsule, which on gross section shows small cystic areas containing bloody fluid, and microscopically a glandular structure with characteristic uterine stroma about it, and frequently areas of smooth muscle. Numerous theories have been advanced to explain endometriosis, but none account for the presence of all aberrant endometrium. The finding of endometriomata in operative scars seems to substantiate Sampson's theory of implantation; but there are so few cases, in comparison with the great number of operations in which the endometrium is exposed or cut across, that some other factor besides implantation may be necessary for the growth of the lesions. Microscopical diagnosis is easy, and diagnostic curettage is very important. The treatment consists in entire removal of the lesions, or in total ovarian ablation either by removal of the ovaries or by their irradiation to the menopausal dose. Greater protection of the abdominal wound during pelvic operations would probably prevent some scar endometriomata. The prognosis is excellent if the lesion is definitely understood and correct methods are used either to remove it or to cause cessation and atrophy of the growth.—Epitome, *Brit. M. J.*, Aug. 10, 1929.

Clinical and Laboratory Notes

AN APPLIANCE TO PROTECT THE HANDS OF THE RADIUM WORKER

BY HUGH MACKAY, M.D., F.A.C.P.,

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When a radium plaque is used topically it is our custom to invest it with oiled silk or rubber dam as a protective covering. It is well known that repeated exposures to small doses of radium rays may cause serious degenerative changes in the skin of the operator's hands. This appliance obviates this danger. Fig. 1 shows a lead block, A, 4½ cm. square; it is covered with brass, 1 mm. thick, on all exposed surfaces. The intervening space is filled with lead. Centrally, an aperture 2 cm. square is cut through the investing brass covering and underneath this the lead is hollowed out, leaving a well or cavity, 2½ cm. square, in the centre of the lead block. A 1 mm. brass thimble (B), 2 cm. square and 1 cm. in depth, is constructed to fit accurately in the opening of the lead block. A central diaphragm divides the thimble into two approximately equal chambers, either of which may be used for the reception of the plaque. A small rubber band is stretched *tightly* about the centre of the thimble which is then placed in the aperture of the lead block (see Fig. 2), and over this a sheet of oiled silk, and above this the radium plaque with collar button attachment. The rubber band prevents the thimble from falling into the well. This collar button attachment is now grasped with the rat-toothed point of an eight-inch artery forceps and gently forced down into the well in the lead block. The plaque is immediately threaded, as seen in Fig. 3.

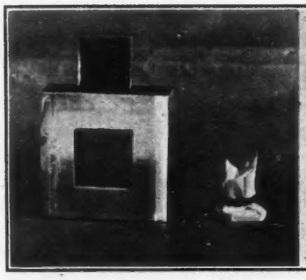

FIG. 3
Showing radium plaque threaded.

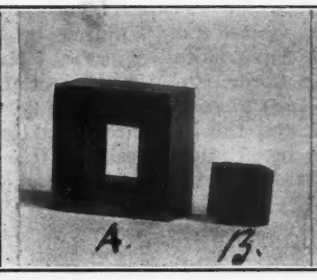

FIG. 1
A.—Lead block, 4½ cm. square, 2 cm. thick. B.—Brass thimble 2 cm. square; rubber band about centre.

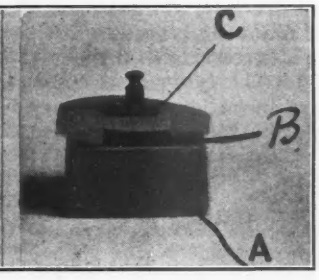

FIG. 2
C.—Radium plaque ready to thread.

THE DETECTION OF MILK ADULTERATION

The freezing point of milk samples has been used since 1898 in Holland as a means of determining whether added water is present, and Mr. A. van Raalte, D.Sc., of Amsterdam, contributes an interesting note on the value of this method to the May issue of the *Analyst*. He states that it is generally agreed, as the result of very prolonged investigation, that normal mixed milk has a freezing point between –0.54° and –0.57° C. Milk with a freezing point nearer to zero than –0.53° C. is taken as indicating adulteration with water. Dr. van Raalte adds that in Amsterdam each year about 30,000 samples of milk are analysed—that is, about one sample for every thirty inhabitants; in 1927 only 2 per cent of such samples were found to be adulterated with water. The freezing point test is now coming into use in the United States and in Germany, and figures found in both these countries are said to be in absolute conformity with those in Holland. Dr. van Raalte suggests that this method therefore deserves international acceptance.—*Brit. M. J.* **2**: 36, July 6, 1929.

REBREATHING IN INTRATRACHEAL ANÆSTHESIA*

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One of the few disadvantages accompanying the intratracheal method of anæsthesia is that a certain degree of apnœa results when the administration of ether is continued for periods

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lasting over one hour. It is not unusual to observe that respiration becomes noticeably shallow or sighing in character with resulting pallor and lowered blood pressure. This is due to the purely open character of the administration, as well as to the other factors which cause respiratory depression during ether anæsthesia.

So-called "open ether" as administered on a mask is in reality a semi-open or semi-closed method, varying in degree with the thickness of the covering of the mask, and on this account the carbon dioxide content of the blood is not depleted to the same extent as in intratracheal anæsthesia.

It has been customary in the past to combat this condition of apnœa by supplying carbon dioxide and oxygen at frequent intervals during the anæsthesia and especially at the end of the operation. This has proved relatively satisfactory but is usually not resorted to until a greater or less degree of acapnia has already taken place. It involves the use of extra apparatus and a certain amount of expense, and on account of the increased flow of gases may disturb the level of anæsthesia.

The following procedure has been carried out in the Montreal General Hospital and its results seem to justify its use. For all major abdominal operations the ordinary No. 24 French catheter is replaced by a No. 22 and this is inserted into the trachea and ether insufflation is begun. At the same time or later as convenient a No. 18 French catheter is introduced alongside the original one and to approximately the same depth. A soft rubber bag of 2 litres capacity with a small opening at each end is then attached to the free catheter and the distal end of the bag is closed by a small adjustable clamp. The bag rapidly fills up and its tension is regulated by the clamp. Rebreathing takes place throughout the whole operation with marked advantage to the patient's colour and general condition. The bag may be emptied at intervals and reattached to the catheter.

It is obvious that under these circumstances less ether will be required, in some cases as little as 2 oz. an hour. Because of the slow rate of evaporation, cooling of the vapour supplied to the patient is reduced to a minimum, with the additional advantage of the warmth and moisture of the rebreathed mixture.

The second catheter may also be employed to further advantage as a suction tube in the event of respiratory obstruction caused by mucus in the trachea, and is always used as such at the end of operation.

If desirable, and especially where shock is present, the catheters may be reversed, the smaller tube carrying the ether and the larger one being attached to the rebreathing bag.

The above procedure has been carried out in hundreds of cases with satisfactory results. No after ill effects have been noted due to the presence of the catheters in the trachea.

The double tube may be used in nose and throat and face surgery leaving the auxiliary catheter free. It is then led in a downward direction over the forehead of the patient. This has two advantages. It is a most efficient drain for any foreign matter which may accumulate in the trachea and secondly the surgeon is spared the necessity of inhaling the expired air and ether of the patient.

TRANSILLUMINATION IN BREAST LESIONS.—M. Cutler calls attention to the value of transillumination as an aid to the diagnosis of breast lesions, and especially to their localization in cases of bleeding nipple. The examination is made in a totally dark room with a Cameron transilluminating electric light placed against the under surface of the breast and gradually moved for the inspection of different areas, so that any particular portion is directly between the light and the examiner's eye. The degree of translucence can be increased by compressing the breast between the hand above and the light beneath. The findings vary normally, depending mainly upon the relative content of fat, fibrous tissue, and epithelial elements. The study of 174 pathological breast conditions showed the value of the method as an aid to differential diagnosis and treatment, it being found that acute, subacute, and chronic inflammations present a diffuse opacity, which diminishes and disappears as the inflammation subsides. Solid tumours are opaque, the degree of opacity varying with their size and location, but without affording a means of differentiation between benign and malignant tumours. Cysts containing clear fluid are translucent, and this may be of great value in differentiating carcinoma from tense deep cysts with skin adherence clinically simulating a malignant growth. Blood effusions are intensely opaque, and a traumatic hæmatoma shows an irregular outline disappearing as the blood is absorbed. The method is of especial value in cases of bleeding nipple in which no tumour can be palpated, and it affords a means of distinguishing between those due to a single localized papilloma and those caused by multiple papillomata, its practical importance being demonstrated by those cases in which the removal of a duct papilloma has failed to cure, while on subsequent transilluminations several opacities point to the existence of multiple lesions. When, however, the discharge from the nipple is not distinctly hæmorrhagic, localization may be impossible.—Epitome, *Brit. M. J.*, Aug. 10, 1929.

Editorial

A RARE SEQUEL OF VACCINATION

THE danger arising from the rare development of an acute affection of the central nervous system affecting chiefly the cerebrum, as a sequel of primary vaccination in children of school age, is being unnecessarily emphasized in the daily press by members of the Anti-vaccination League, both in England and in Wales. Two cases of this unfortunate sequence of vaccination are recorded in a recent number of the *Lancet*. One is reported by Dr. John Taylor, Pathologist to St. George's Hospital, in which a healthy woman 31 years of age, died after a primary vaccination on the seventeenth day with post-mortem findings of post-vaccinal encephalitis. The second case is reported by Sir Thomas Horder, in which a boy aged 4½ years unfortunately happened to be exposed to a developing case of smallpox, while waiting in the out-patient room of St. Bartholomew's Hospital. The child had been suffering for four days previously from a feverish attack associated with headaches and earache. On account of this exposure it was thought wise to vaccinate both him and his mother who had accompanied him. The vaccination took well, but on the eighth day after the usual four point insertion of vaccine the child became drowsy; on the eleventh day he was stuporous, and showed signs indicating some affection of the cerebro-spinal system. On the fifteenth day, as the symptoms continued, 5 c.c. of his mother's serum was slowly injected intrathecally. Following this injection, improvement set in. On the nineteenth day the child was more lively, improvement in his mental state set in rapidly and in a few days more the child had quite recovered. It is to be noted that in this case the vaccination was undertaken during the late stage of some infection of unknown character, but the striking effect which followed the injection of the mother's serum would point to the operation of some specific vaccinal antibody in the serum.

In a report by Professor Turnbull, Director of Pathology at the London Hospital, on a previous case, he says, "I do not consider that this is a new disease though it appears to have become more common. It has been shown that the disease is not due to any special vaccinal lymph, and that it is not caused by any fault in the preparation of the lymph or any contamination of the lymph. The exact cause has not yet been discovered. Some consider that the disease is due to the vaccinal lymph itself, acting upon persons abnormally sensitive to it. Others believe that the vaccinal lymph lights up an infection lying dormant in the system, and this latter view has some support in the observation that a very similar complication may follow an attack of measles or other exanthem and also anti-rabic treatment. All authorities are agreed that the disease has nothing to do with epidemic encephalitis."

Thus far this complication of vaccination has been confined chiefly to the Netherlands and to England and Wales. In most of the cases the vaccination appeared to run a normal course until the development of the cerebral symptoms. Two committees in England have reported upon this condition, and the Ministry of Health in England has sent out orders that it must be informed of all cases in which any affection of the central nervous system develops within a month after vaccination. In the report of the Rolleston Committee it is pointed out that the risk of this development is a very slight one, as 51 deaths only were reported in a period during which approximately 2,000,000 vaccinations and re-vaccinations were performed, and more than 3,000,000 charges of government lymph had been issued. It is also pointed out that it is a complication that has almost never followed vaccination in infants under two years of age, and is of equal rarity in the re-vaccination of older children or adults. Two recommendations have been made. By order of the Health Department four insertions of vaccine have hitherto been made in each primary vaccination. This many medical officers of health consider to

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be an unnecessary amount, and it is recommended by the Committee that vaccination should be performed before the child is two years old, and that one insertion only should be used at that early age; and that re-vaccination should take place between 5 and 7 years and between 14 and 16 years. In the Netherlands primary vaccination was effected for the most part at the school age, and it is when given at this age that the cerebral symptoms are most liable to develop. Influenced by this fact, a temporary suspension of primary vaccination at the school age has taken place in that country.

For the past few years smallpox of a very mild type has existed in many districts in England and America, but severe cases with fatal ending, appear from time to time, indicating what might take place if the immunity secured by vaccination is neglected by a community. Canada had her lesson two years ago, in the development of the disease in an extremely malignant form in the city of Windsor. Although encephalitis as a sequel of vaccination has not, to our knowledge, appeared in this country, it would be advisable to follow the advice of the Rolleston Committee. Vaccination should be performed before a child reaches the age of two years, and the number of vesicles should not exceed two.

A. D. BLACKADER

THE VALUE OF THE BACTERIOPHAGE

THE laboratory evidence in support of the therapeutic value of the bacteriophage is very strong. It kills and dissolves bacteria in large numbers, and does so without any of the violence to the tissues which is so apt to result from chemical bactericidal agents. It can permeate tissues and, relatively, is innocuous, although repeated inoculations may lead to an increased susceptibility to infection. It also not only acts on bacteria directly, but increases the phagocytic powers of the leucocytes. Finally a culture dissolved or "lysed" by the bacteriophage is antigenic, *i.e.*, it produces the same antibodies as do killed bacterial cultures but more rapidly and sometimes to a higher titer.

These are exceedingly valuable qualities and yet the bacteriophage is by no means taking as large a place in therapeusis as it gave promise of doing. It is not, however, a substance which can be employed indiscriminately. All bacteriophage races do not possess equal advantages. Many of them cannot "lyse" more than a single strain of bacteria, or are not of maximum virulence for their particular strains. This accounts for some of the failures which have attended its use.

Some interesting observations on the use of bacteriophage in staphylococcic infections have recently been published by Dr. N. W. Larkum, although he reminds us of the difficulty of interpreting results in this type of infection. Its manifestations are varied and one patient does not serve as a definite control for another. He has been able, however, to bring together the reports of several authors who have employed the bacteriophage in a large number of cases of staphylococcic infections, of all varieties. As far as could be judged from the data collected the effects of the bacteriophage were more successful than could be attributed merely to coincidence. Nor could the enthusiasm of the individual worker entirely account for the favourable reports, for whereas in the bacteriophage treatment of other infections such as typhoid, dysentery, etc., many workers have given unfavourable reports, only one unfavourable report has as yet appeared concerning staphylococcus infections, and in this case the doses seem to have been inadequate.

In addition to these collected reports Dr. Larkum has been able to watch the use of bacteriophage for more than two years, as distributed by the Michigan Department of Health, and he now has over 300 individual reports which contain certain detail enough to permit of some conclusions. The bacteriophage used was all prepared from a single staphylococcic strain. It was issued with instructions to give 2 c.c. subcutaneously on successive days for two days in all

staphylococcic infections, and local applications in all conditions except furunculosis.

The summarized results are encouraging. In furunculosis, *e.g.*, the percentage of cures was 78 per cent. Nineteen per cent showed recurrences, but many of these were mild and cleared up gradually. Only 3 per cent showed no improvement.

Dr. Larkum is anxious not to draw premature or unjustifiable conclusions but he feels that a comparison between treatment of these intractable staphylococcic infections by bacteriophage filtrates and vaccine is greatly in favour of the bacteriophage, and he hopes that its use will be extended. The bacteriophage possesses the advantage of giving no severe reaction and yet of producing apparently complete immunity. The mere percentages also do not give an adequate idea of the immediate effects which follow on the use of the bacteriophage. The lesions show early and rapid regression, the exudate becomes thin, and pain is relieved.

H.E.M.

THE SPAN OF LIFE

SUCH record as is available credits Methusaleh with having reached the mature age of 969 years before he shuffled off this mortal coil. Archbishop Ussher gives B.C. 3317 as the date of his birth. From this it is computed that Methusaleh's life ended in B.C. 2348—that fateful year in which, "in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened. And the rain was upon the earth forty days and forty nights." The cause of Methusaleh's death is not stated. If we invoke the law of chance, it may be surmised that he was a flood victim. Such surmising permits of speculation as to the age he might have attained had he been worthy of admission to the Ark and of a death from natural causes. But apart from such speculation he is conceded an age-record which even the most enthusiastic life-extensionist of this era dares not hope to surpass.

The Q-vitamin, or whatever the factor may have been which accounted for antediluvian longevity, seemingly lost its potency in the flood. A few centuries later Moses, great pioneer in health work, set the limit of justifiable ambition in respect of age at three score years and ten, and offered small inducement to venturing on to four score. This pronouncement has, perhaps, been taken too literally. Many have become octogenarians, and not a few have become nonogenarians, with no loss of either happiness or usefulness, and their children have called them blessed. But Moses made no extravagant claims for his health code, and thus set an example which has not been universally followed.

King Hezekiah quite naturally went into a "blue funk" when Isaiah told him to put his house in order, and very humanly rejoiced when he was given a respite of fifteen years. To-day we are being told that within a few decades the average span of life has been materially increased, and it is interesting to note that, in the United States, the average extension just equals that which was accorded to Hezekiah. God's mercy in the individual case; American efficiency in the case of the one hundred per cent.

Zeal of God, according to St. Paul, should be with understanding. Should this not apply to zeal of all things? We have accomplished much within recent decades in which we may glory justifiably. But it is the part of wisdom to interpret carefully. Because of betterment in our knowledge, the infant mortality rate has been reduced dramatically. Tuberculosis destroys a much smaller proportion of the younger age-groups than formerly. Such are prominent factors in the accounting for the increase in the average duration of life. The obstetrician of the moment, if he thinks it worth while, may endeavour to quiet the wail of the latest arrival by the assurance that it has a much better chance of surviving infancy than had either of its grandparents; and also that circumstances of this time favour a more healthful existence than could have been anticipated for even its parents when they emerged into the world. But he should

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hesitate about making more sweeping statements. A part at least of Isaiah's vision appears to be nearly within realization. The infant of days is becoming a rarity. The speed to which we have attained however, does not permit the child to outdistance the angel of death for the hundred years which that great optimist envisaged. Despite the cheery prognostications of eminent health enthusiasts and professors of economics, we are not within very short distance of a normal death-age of one hundred. In fact, some critical statistics-analysts lead us to the gloomy fear that the proportion of those now alive who are likely to attain a good old age is not much greater than that of preceding generations.

In England and Wales, for several years past, improvement in the death rate has been shared in by all age groups, although the gain has not been very great in the more advanced periods. In the United States there has been, on the whole, loss rather than gain in age-periods beyond forty. Statistics for all of Canada have not been collected for a sufficient number of years to allow of satisfactory analysis in this particular. It is unlikely that we have, at best, progressed farther than the mother country. As the younger age-groups increase in size, they will pass over greater numbers to the more advanced age-groups, and we shall have more people of an age suitable to cancer and the degenerative diseases. Modern methods of recreation, of preserving youthful figures, and of living in general promise no reduction in the prevalence of metabolic, circulatory, and nervous disorders. In short, babies and tuberculous youngsters are being saved, not to become Methusalehs, but rather to swell the numbers who will fall victim to the diseases or disorders of middle age.

The facing of facts need not engender pessimism, but we surely should take cognizance of the trend in death rates. Safe deliverance from the perils of infancy and youth would be much more satisfying if there were less likelihood of life terminating at or shortly after middle age. Of course effort to save the kiddies and the young should continue without slackening, but should there not be comparable effort on behalf of the forty-years-plus groups?

We cherish the hope that lessened incidence and better treatment of the infections of early life will effect reduction in the prevalence of degenerative conditions. Full co-operation of the profession with official health agencies is essential to the best results in this respect. Early and adequate treatment of syphilis should afford a measure of protection against vascular and other degenerations. Destruction of septic foci is so frequently followed by the dramatic disappearance of disabling symptoms as to warrant careful attention to such foci as a preventive measure. The judicious management of cardiac and arterial disease will surely meet with merited reward. Early recognition and prompt removal of malignant tumours should prolong many lives. This is sufficient to indicate the possibilities which lie at hand. Obviously, neither official nor non-official health organizations can deal with such conditions as effectively as with conditions which lend more readily to mass treatment, but it may be expected that such organizations will "muss in" if there is failure on the part of the profession to recognize the importance of utilizing to the full the knowledge we have of preventive methods. Should physicians avail themselves of every opportunity which presents in the ordinary course of practice, and fully cultivate their respective fields in this particular, it can scarcely be doubted that the result would be advantageous to all concerned. And until physicians apply themselves seriously to the practice of preventive medicine, we may be reasonably charged with failure, despite our more exact knowledge, to secure results comparable to those being obtained by lay organizations engaged in public health work. Once it becomes known that the profession is actively concerned in detecting and remedying disease in its incipiency, the periodic health examination will become a popular birthday pastime, and there will be little occasion for the sort of publicity which most of us regard with disfavour. And in the most strictly professional way we will contribute, perhaps very notably, to lengthening and broadening the span of life.

W. H. HATTIE.

TEAM-WORK IN PRACTICAL MEDICINE

IN his thought-provoking Presidential Address, delivered before the British Medical Association at Manchester, and reproduced elsewhere in this issue of our *Journal*, Professor Burgess deals with the debt that surgery owes to the ancillary sciences, physics, chemistry, and physiology. At almost every turn the surgeon makes use of information derived from the laboratory as the result of the experimental method. What is true of surgery is also true of medicine. We are, indeed, face to face with the dawn of a new era in practical medicine. We use the word "dawn" advisedly.

It will be interesting to recall, for a moment, the various influences that have dominated medical practice and medical teaching in the past. After the close of the Greek period, say, with the death of Galen, botany came to the fore, and from the somewhat crude and unpromising efforts of the root-diggers and herbalists was born scientific botany, and, in course of much time, pharmacology. Then came anatomy, the pre-eminence of which, due on the continent largely to the work of Lieutaud, and in Britain to the influence of the Monros, the Hunters, Pott, Cheselden, and Sir Astley Cooper, persisted for two hundred years. In fact, only now does it seem to be seriously challenged. Then came morbid anatomy, the inspiration of which we owe to Morgagni, Baillie, Rokitansky, and Virchow, an inspiration that was more potent twenty years ago than it is now. To-day we are in the era of physiology and its offshoot bio-chemistry. In the past, medicine did much to aid the infant science of physiology. Now the debt is being more than repaid, and both medicine and surgery are being remade in the light of applied physiology and the experimental method. All well trained physicians will be ready to admit this. In fact, the line that separated applied physiology and experimental medicine from the art and science of medicine is all but obliterated. We need only to cite the discovery of hormones, the development of endocrinology and the chemistry of metabolism, tests for renal function, the elucidation of the vitamins, and the recent advances in the physiology of the nervous system, to illustrate the point.

As we have hinted, the time has gone by when the causes, manifestations and results of disease, are to be looked for in the various organs, and there only. The modern view is that the morbid changes that may be found in a tissue or an organ do not constitute the disease. They are only an expression of it. Disease, rather, is disturbed bodily function, not localized to any one organ, but affecting more than one, and, moreover, usually, the whole body. The case for physiology has been well put by Dr. W. E. Dixon,* in his Presidential Address delivered on July 24th at Capetown before the Section of Physiology of the British Association for the Advancement of Science, whose words in this connection may well be quoted.

"The term 'physiology' is usually used to designate the science of function, whether it is studied in broad outline and dealing with the mechanism of action or as the physico-chemical mechanisms leading up to this action. Disease means the unusual functioning of tissues, which may be the result of accident, hereditary weakness, or parasitic organisms. Generally it is wrong to speak of this as mal-functioning; the unusual functioning is physiological, and, perhaps, the best for the organism under the unusual conditions. The science of medicine, then, is nothing more than trained and organized commonsense based on physiology". And, again, "More and more is physiology being regarded as the application of physics and chemistry to the phenomena of life."

This being so, we may find here the justification for those who, in planning the curriculum in connection with the lengthened course of medical studies, gave up much of the added time to the so-called "pre-medical" subjects of physics and chemistry, and the brilliant results that are now being obtained from applied physiology and experimental medicine should go far to allay the fears of those who thought that in the new scheme of things the clinical side was being neglected. Nowadays, the close dependence of practical, *i.e.*, "clinical" medicine upon the pre-medical subjects will hardly be denied. The question is, how best to ensure that the special know-

* *Brit. M. J.* **2**: 138, July 27, 1929.

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ledge acquired in the preliminary years will not be forgotten but will be available for the elucidation of therapeutic problems. With the medical curriculum crowded as it is with differing subjects there is a tendency to regard these as forming, as it were, water-tight compartments. The correlations that are so important are often not made. Our clinicians should be good physiologists and good chemists, and the physiologists and chemists should have a good appreciation of clinical needs. But, inasmuch as clinicians can hardly be expected to be specialists outside of their own lines they could, very properly, call in the services of those who are competent to give them advice on the special problems arising from time to time in their work.

For the student it would be well to institute courses in applied physiology and applied bio-chemistry, conducted by competent instructors, which would bridge over the gap that generally exists between the pure sciences of the pre-medical years and the applied science of the clinical years. This idea is to be put in practice, we understand, by one at least of our Canadian universities.

For the patient, there can be no doubt that a correlation of effort between the clinician and the pure scientist would be beneficial. Not long ago, in connection with the lamented death of one of our own profession, in Toronto, the services of the physiologist and the metabolism expert were called into requisition. In such cases the special and accurate knowledge of the pure scientist may be of the greatest help to those whose duty it is to treat disease.

The ideas here brought forward are gradually becoming accepted and are being crystallized into action. Professor Burgess, for example, in the address referred to, states that the Professor of Physiology in the University of Manchester has been placed with his colleagues in Anatomy, Physics, and Pharmacology on the consulting staff of the Royal Infirmary. Should such action be contemplated here it would be well, in our opinion, to add to the number the professors of pathology and bio-chemistry. In McGill University a step in the right direction has been taken, in that the Research Professor of Physiology works in the closest harmony with the Department of Experimental Medicine. There is no doubt that intelligent team-work will, in the future, bulk more largely in connection with the efforts that are being made to prevent and control disease.

A. G. N.

Editorial Comments

DR. BLACKADER'S RETIREMENT

Those who were present at the recent meeting of the Association in Montreal, and, doubtless, others of the profession, will have learned by now of the regretted retirement of Dr. Blackader from the office of Editor of the *Journal*.

The lot of an editor is not always and altogether "a happy one", but there are exceptions, and Dr. Blackader, we know, has experienced much happiness, as his readers have had much gratification, from his incumbency of the editorial chair. In truth, the duties of an editor are onerous, requiring wide scholarship and incisive judgment, tempered with unfailing tact. Dr. Blackader has manifested these qualities in generous measure. How much his work, both in connection with the *Journal* and his chosen specialty—pædiatrics, has been appreciated can be seen in the resolution passed at the Annual Meeting, where it was decided to establish in the near future a Blackader Lectureship in Pædiatrics, than which, to Dr. Blackader himself, no more gratifying and fitting testimonial could have been devised.

It would be ungracious, also, if the incoming editorial staff failed to record their sense of the loss that all have sustained in the senior editor's retirement. The *Journal* will miss his untiring effort; the sense of personal loss on the part of the staff is, however, mitigated by the knowledge that the late editor can be called upon for counsel, and that, from time to time, the *Journal* will have the benefit of productions from his facile pen. This makes their task so much the easier. Dr. Blackader will be, as he phrased it himself, "a free lance," and will have none of the responsibilities of office. It is our intention to deal with these matters more adequately in the next issue of the *Journal*. In the meantime, all will join us in offering to Dr. Blackader our best wishes for his welfare in his retirement.

A.G.N.

JOHN MITCHELL BRUCE

A great figure in the ranks of medical men has passed on in the person of John Mitchell Bruce, C.V.O., M.D., LL.D., F.R.C.P., who died in London on July 7, 1929, at the age of eighty-three. Dr. Bruce was, perhaps, better known to an earlier generation of physicians, and, on this side of the water on account of his very popular text-book on Materia Medica and Therapeutics, which passed through many editions, and an excellent work on The Principles of Treatment.

Dr. Mitchell Bruce was born at Keig in Scotland, receiving his early education at the Aberdeen Grammar School. He proceeded in course to the University of Aberdeen, where he took the degree of M.A. in 1866. He graduated M.B. at the University of London, and M.D. in 1872. Following this he engaged in post-graduate studies at Vienna and other European schools, and on his return to England engaged in pathological research under Sir John Burdon-Sanderson and Professor Emanuel Klein. From 1871 onward he was connected in a very vital and stimulating way with the Charing Cross Hospital, becoming in succession Lecturer in Physiology and Pathology, Assistant Physician, Physician, and, on his retirement in 1904, Consulting Physician. From 1883 to 1890 he was Dean of the Medical School of the hospital.

In addition, Dr. Bruce held many other important medical posts, being physician to the East London Hospital for Children, to the Brompton Hospital for Consumption, and Diseases of the Chest, and to the King Edward VII Sanatorium at Midhurst. He was elected a Fellow of the Royal College of Physicians of London in 1878, and became Senior Censor and Lumleian Lecturer in 1911, and Harveian Orator in 1913. He had been, also, president of the Medical Society of London and president of the Section of Medicine of the Royal Society of Medicine. At the meeting of the British Medical Association, at Brighton, in 1886, Dr. Bruce was vice-president of the Section of Pharmacology and Therapeutics and again, at London, in 1895. In 1899, at the meeting at Portsmouth, he was president of the Section of Medicine, and, at London, in 1910, he delivered the address in medicine, taking as his subject "The dominance of etiology in modern medicine."

He was created C.V.O. in 1919, and in the same year received the honorary degree of Doctor of Laws from the University of Aberdeen.

Dr. Mitchell Bruce was also noted for his literary activities. At one time he had been on the staff of the *Medical Times and Gazette;* later, co-editor of the *Practitioner,* and assistant editor of Quain's *Dictionary of Medicine.* His Lettsomian Lectures on "The diseases and disorders of the heart and arteries in middle and advanced life, and his Lumleian Lectures on "Cardio-vascular degeneration, "were notable achievements.

Dr. Bruce was a great physician and clinical teacher and exerted a great influence upon those with whom he came in contact. Of a sterling and gracious personality he possessed to a rare degree the esteem of the medical profession. One of a notable group, with Burdon-Sanderson, Lauder Brunton, Ferrier, and Klein, Bruce laid the foundations in the seventies for that scientific development in physiology, pharmacology, and histology which was destined to prove so fruitful. His influence lives on.

A.G.N.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

Canada, particularly Canadian Medicine, as represented by the Canadian Medical Association, may very rightly be proud of an experiment which came to a successful conclusion in Toronto on Saturday, August 10th, when nine candidates out of a class of twenty-three were approved in the Primary Examination of the Royal College of Surgeons of England.

At our meeting in Regina four years ago it was decided to invite the Royal College of Surgeons to hold the Primary Examination in Canada. Naturally, numerous conferences and the interchange of many communications were necessary to bring about a modification of a plan which had been in operation in one place for nearly a century. We in Canada were just as anxious as the officials of the College that the examination should be in every particular a replica of that conducted in London. To this end it was agreed that the College should send out four of its regular examiners while we were asked to nominate two assessors to assist.

On Monday, August 5th, the following gentlemen, all of London, England, arrived in Toronto, Sir Holburt J. Waring, officially representing the Royal College of Surgeons; Professor William Wright and Professor W. E. LeGros Clark, anatomists; and Professor C. Lovatt Evans and Professor John Mellanby, physiologists.

The Canadian Medical Association nominated Professor J. P. McMurrich and Professor Chas. Best as assessors in Anatomy and Physiology, respectively.

On Tuesday afternoon the candidates were given three hours to write the paper in Anatomy, while on Wednesday afternoon a like time was set aside for the paper in Physiology. On Friday and Saturday the viva voce examinations were held in the Anatomical Building of the University, each candidate being interrogated for a period of forty minutes — twenty in anatomy and twenty in physiology. The London professors examined alternately while the Canadian Assessors were present throughout.

At the conclusion of the sessions of each day,

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a conference was held, attended by the four Examiners, the two Assessors, the Official Visitor, Sir Holburt J. Waring and Dr. T. C. Routley, the Superintendent of the examination. The marks of the candidates who had completed the examination were then tabulated and a decision arrived at as to whether each had been approved or referred. Immediately following this conference the Superintendent of the examination received each candidate and informed him as to the result. (This method has much to commend itself to those who are subjected to the ordeal of an examination).

The viva voce part of the examination was visited by many Fellows of the Royal College, also by several prominent surgeons from the United States.

The candidates appeared to be unanimous in their expressions of appreciation of the fairness of the papers and the practical nature of the orals.

The examiners were kind enough to state that the arrangements for the examination were in every particular quite as satisfactory as in London.

Before adjournment the representatives of the College together with the Assessors, Dr. Primrose, who had returned from England expressly for the purpose of attending the examinations, and Dr. Routley, discussed thoroughly many of the aspects of the examination, both as to present and future. Suffice it to say at this juncture that all agreed that the experiment had been well worth while.

The following candidates were successful:—George Alexander Fleet, Montreal; Frank Lappin Horsfall, Montreal; Hubert John Muth, Springside, Sask; Hyman David Isaacs, Winnipeg; Julian M. Bruner, Rochester, Minn.; Jack Hesketh Beasley, Toronto; Lloyd Reath Olver, Sydney, Australia; Ralph Marnham, England; Vithal Nagesh Shirodkar, Bombay.

This account would be incomplete without a word of thanks being extended to Professor McMurrich, Professor Best, Professor Watt, Drs. Linell, Cates, Hyland, and all others associated with them for the splendid services rendered in arranging the details of the examination. It was a real privilege to act as Superintendent of the examination working in co-operation with such a delightful group of examiners.

T. C. ROUTLEY

INDUSTRIAL HAZARDS AND THE MANUFACTURE OF ARTIFICIAL SILK

It seems to be almost inevitable in connection with various industries, especially those conducted on a large scale, that there should be inherent in them special dangers to the operatives, both in life and limb. Some of these dangers are gross and, as it may be termed, mechanical, leading to wounds of all kinds, fractures, dislocations, and even death; others are more subtle, more insidious in their onset and course, more apt to affect special organs and systems, and more difficult of diagnosis. Such may be termed toxic, and are, naturally, apt to be met with in connection with industries that involve chemical manipulations. The classic example of the latter type is the necrosis of the jaw that used to attack the workers in the match factories in the days when yellow phosphorus was used. New industries frequently bring in their train new dangers or resurrect old ones. The manufacture of high explosives leads to cases of trinitrotoluol poisoning, to cite only one instance. Now we are beginning to hear of certain dangers attendant upon the production of artificial silk, an industry that has developed in a phenomenal way within the last few years.

The manufacture of artificial silk resembles, in a general way, the manufacture of photographic film, as there are both "acetate" and "nitrate" processes. The acetate process, fortunately, is the predominating one. At a certain stage in the process the alkali-cellulose is treated with carbon bisulphide in a hermetically sealed mixer or "churn." When the reaction is concluded the gases are removed by suction, but the workman has to put his head inside the container in order to remove the orange coloured adhesive mass that is produced. Now, as small a proportion of carbon bisulphide as 0.3 part in 10,000 parts of air is competent to produce the slighter manifestations of poisoning, which are, headache, nausea, and muscular weakness. It is not surprising, therefore, that distressing and even dangerous symptoms are sometimes produced. In addition to those mentioned, cases have recently been reported in which delirium, loss of muscular power, almost complete defect of sensation and sometimes amblyopia have occurred. Similar cases of carbon bisulphide poisoning were recorded in years gone by, in connection with the "Parkes" or "cold cure" method of vulcanization of rubber, but the special regulations established to deal with this menace have been so successfully applied that the matter had been almost forgotten, until artificial silk came into vogue.

The risk from carbon bisulphide poisoning is not the only one to be reckoned with, moreover. Sulphuretted hydrogen, which is generated at the spinning troughs, is also provocative of unpleasant symptoms. A small amount of this gas, not more than 1 part in 10,000 parts of air, is sufficient to produce photophobia, sharp pain, and conjunctivitis.

It is well for the profession to be informed upon this important matter, for, with the establishment of large artificial silk factories in

Canada, it is not improbable that cases of carbon bisulphide and sulphuretted hydrogen poisoning will be met with here from time to time.

A.G.N.

AN ACTIVE RESEARCH DEPARTMENT

We have to acknowledge the receipt of a beautifully bound volume containing Selected Articles from publications during the past ten years of the Department of Pædiatrics in the University of Toronto, and from the Research Laboratories of the Hospital for Sick Children. The volume is dedicated to Miss Angelia M. Courtney, director of the Laboratories, "on the completion of twenty years work on the study of the metabolism of children." During this period she has carried out many important researches and has published numerous valuable papers, and although in many of them her name is associated with the names of other workers, yet in all she has been the directing head. During the first ten years her investigations in infant metabolism were conducted in the Babies' Hospital of New York under the direction of Dr. L. Emmett Holt. During the last ten they have been pursued in the Research Laboratories of the Department of Pædiatrics in the University of Toronto under the direction of Dr. Alan Brown, and with the assistance of Dr. Gladys Boyd and other members of the staff of the hospital. It is with these last ten years of her work that we are chiefly concerned, as it was during this period that the researches reported in this volume have been carried out.

The volume is a most interesting one, and all the papers in it have a definite value. It opens with the full list of the publications and researches of Miss Courtney.

The first four papers in the volume contain the report of Miss Courtney's investigations of problems in the disorders of metabolism arising from deficiencies or excess in certain constituents of infant foods. These papers are followed by a series reporting the investigation of the metabolism of salts in the nephritis of childhood by Miss Courtney and Dr. Gladys Boyd. Other series follow by Dr. Boyd on Nephrosis in Children, on the Treatment of Diabetes in Children, and on the evidence of the Regeneration of the Pancreas in an Insulin-treated Child with Diabetes. Following these appears a series of papers by Dr. F. F. Tisdall and Dr. Drake, on the Carbohydrate Metabolism of Infants under conditions of disordered nutrition and acute intestinal intoxication. Papers detailing important researches also by Dr. Tisdall and Dr. Brown are presented on the effect of ultra-violet rays on rachitic infants, of heliotherapy on bone tuberculosis, and on calcium and phosphorus metabolism in patients with fractures. Another valuable series of investigations are reported by Dr. Brown and Dr. Tisdall on the anti-rachitic effect of sunshine and skyshine at various seasons of the year, and on the power of various kinds of special window glass to permit the passage of the ultra-violet rays in light. In addition to these valuable papers chronicling research, a series of important clinical papers are also contributed to this dedicatory volume. Among others we note the following, an essay on the clinical manifestations of enlarged thymus, by Dr. E. A. Morgan; a clinical and metabolic study of acrodynia, by Dr. Alan Brown and Dr. Courtney; types of thrombopenic purpura hæmorrhagica, by Dr. George Smith; blood transfusion, by the late Dr. Bruce Robertson and Dr. Alan Brown, and a study of fungi in diseases of the skin, by Dr. H. A. Dixon. In all, sixty valuable papers are reported in this volume as the work of ten years; an amount of work which must be regarded as not only very complimentary to Miss Courtney but a great credit to the Research Laboratories of this Department of Pædiatrics, and to the stimulating direction of Dr. Alan Brown.

A. D. BLACKADER

SURGEONS AND THE LAW

Physicians occasionally, surgeons more often, come at times into unpleasant, not to say disastrous, conflict with the law. The former have been prosecuted for revealing what are commonly termed "professional secrets," but are rarely accused of malpractice. The latter, not infrequently, have been sued for performing some operation alleged to have been unauthorized, or for obtaining results somewhat short of what the person operated upon had expected.

With the increased dissemination of medical knowledge among the laity the laity have become more critical, and the general use of the x-ray often reveals deviations from the normal, notably in connection with the setting of broken bones, which the unscientific person may seize upon, honestly or dishonestly, for the purpose of obtaining damages. And, further, since the kind of evidence that satisfies the scientific mind is not, necessarily, the kind of evidence that satisfies the legal mind, injustice occasionally is done. Surgeons, for example, have been mulcted in damages because the x-ray picture had shown that after a fracture had been set the fragments had not been restored to perfect apposition and alignment. It is clear to medical men, of course, that the functional result, rather than the anatomical one, is the important thing. In many cases a perfect anatomical result is unnecessary and, indeed, unattainable, except by open operation, which may not be justifiable. Not long ago, in England, a case came to trial where an able surgeon, who had, it was proved, taken most ex-

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ceptional care for the well-being of his patient, was sued because a fracture, perfectly treated, was followed by a Dupuytren's contracture, a complication well known and not always avoidable, even in the light of present day knowledge. A few more cases of this kind and surgeons will think twice about operating without an express undertaking on the part of the patient and his friends that the operator is not to be held responsible for possible but unavoidable ill-results. But a new hazard besets the surgeons.

Quite recently one of the best known surgeons in Paris was asked by a patient to improve the "æsthetics" of her leg. She was a *couturière*, and her success in her calling depended on the smartness of her personal appearance. The surgeon operated. The unexpected happened; infection set in and the leg had to be amputated. Suit followed and damages in the amount of 200,000 francs were awarded. The case has led to much discussion in medical and legal circles, and the comments of the trial judge, in particular, have caused much feeling. The decision was based not on any allegation of mistake on the part of the operating surgeon, whose skill, indeed, was beyond question, but on the ground that the operation was not justified on pathological grounds. If the matter rests here cosmetic surgery will have to go. Apparently, this is a new form of antagonism between medicine and law. We understand that the General Medical Association of France has decided to intervene in the matter and that the case is to be appealed.

A.G.N.

"THE ANTISEPTIC"

The Silver Jubilee number of our Indian contemporary, *The Antiseptic,* so-called after Lister's immortal discovery, lies before us, and is full of interesting reading. Twenty-five years ago there were only two medical journals in north India, the *Indian Medical Gazette* and the *Indian Medical Record,* and none of importance in south India. The problems relating to the profession of medicine were numerous and calling for solution. To inform and unify the medical profession was the first crying need. Accordingly a new journal was established through the efforts of the Honorable Dr. U. Rama Rau and the late Dr. T. M. Nair, the latter of whom became its first editor. The aims of *The Antiseptic* are summed up in its first issue in the following words:—

> To bring the medical profession in India to its legitimate place in the forefront of all learned professions will require the united efforts of all its members, official and non-official, European and Indian. The parliament of man and the federation of the world is still a poetic dream but it rests with the medical profession in India and in Great Britain too whether the idea of a united medical profession in India, a General Medical Council for India, and a Medical Registration Act for India should remain a dream indefinitely or be brought within the range of practical politics within the next few years.

Besides these laudable aims there were other problems to be attacked, including improvement in the relations existing between the members of the state medical service and the independent medical men, the raising of the status of the various classes among Indian medical practitioners, medical education, and, by no means least, the enlightening of a whole people in the matters of vaccination, sanitation, and public health generally.

The journal prospered in the face of great difficulties and is a monument to the foresight and courage of its founders. On the death of Dr. Nair, ten years ago, the destinies of *The Antiseptic* have been guided most efficiently by the Honourable Dr. U. Rama Rau, whose activities have been widespread in the effort to better the condition of his fellow countrymen. As an example of his valuable work may be cited the establishment of health journals which are published in four of the most used languages, English, Tamil, Telegu, and Canarese.

It is not for us, at this distance, to presume to judge of the medical needs of India or of the value of the efforts of the Indians themselves to improve their local conditions in regard to medicine and the public health, but, at least, it seems clear that the call was there and the opportunity great, and that *The Antiseptic* has played a forcible and meritorious part in bringing about reforms. The journal has our best wishes for success in its attempts to better the condition of the Indian people, to improve the status of the profession, to bring about more harmonius working between its members, English and native, and to raise the standards of medical service and medical education.

A.G.N.

Fourteen cases of scarlet fever have been traced by Ruth Tunnicliffe and T. T. Crooks to three healthy carriers of scarlet fever streptococci. They used the opsonic test for the identification of scarlatinal streptococci which is simple and concise and can be carried out in any public health laboratory almost as quickly and accurately as can the cultural diagnosis of diphtheria. Immunological methods for the detection of carriers of scarlet fever streptococci may now enable us to check scarlet fever outbreaks just as we do diphtheria epidemics. Tunnicliffe and Crooks conclude that as more experience is gained it is hoped methods may soon be introduced not only for determining the quarantine periods for convalescent carriers but also for the isolation of healthy carriers of scarlet fever organisms. —*J. Am. M. Ass.*, 1929

Special Articles

ON EPILEPSY

A Review

BY A. D. BLACKADER, M.D.,

Montreal

The problem of the morbific cause or causes underlying the development of epilepsy is with our advancing knowledge considered as much more complex than it was thought to be when Sir Percy Sargent in his presidential address[1] a few years ago attributed it unhesitatingly to lesions in the brain. Attention has gradually been called to the fact that the existence of even comparatively gross lesions in the brain does not justify the assumption that these are the primary and most important factors underlying epileptic seizures.

The literature on epilepsy has increased in late years to voluminous proportions and is still controversial in character, but during the past year two able reviews have appeared in which the recent advances in our knowledge of the subject are discussed. Sir James Collier[2] made epilepsy the text for his Lumleian lectures delivered at the Royal College of Physicians, and in the May issue of "Medicine,"[3] Lennox and Cobb, of Harvard University, have presented us with a very complete review of the numerous investigations made during the past few years and of the many hypotheses presented regarding the causation of this complicated disease. The present paper is an attempt to present the more important facts appearing in these reviews, and in still more recent papers to our readers.

At the outset of his first lecture Sir James Collier[4] pointed out that epilepsy is met with both in birds and in mammals, in horned cattle somewhat rarely, but in carnivora and primates more frequently. In all of them the several types of the disease are similar to those met with in man. Hereditary transmission has been noticed to occur in many stock animals through several generations.

Three classes of sufferers from this affection may, according to the lecturer, be distinguished: the so-called idiopathic cases in whom no pathological lesions have been found; the cases associated with and apparently in great measure dependent on organic lesions in the brain; and cases in which the attacks are symptomatic of special constitutional disease or intoxication. It is to be noted, however, that in the majority of individuals no form of irritation will give rise to epileptic manifestations[5].

Lennox and Cobb[6] protest against any attempt to divide of epileptics into classes, claiming that all patients having seizures, from whatever apparent cause, possess in some degree a special susceptibility to the development of these attacks, and consider that as we have no means of determining whether this susceptibility forms ten or ninety per cent of the total influence making for seizures, any separation of epileptics into classes, except for the convenience of clinicians, only obscures the main problem of the causation. They assert as a fact that some abnormal condition of the brain cells exists in all cases in which seizures occur.

Special Factors of Etiological Importance

These authors consider that three factors[7] are of etiological importance in the production of the seizures. These factors are:—(a) organic abnormalities in the structure of the brain, or its covering; (b) functional abnormalities in the cells of the brain increasing their convulsive reactibility; and (c) abnormal conditions in the body tissues outside the brain.

That some special instability of the brain cells plays an important part in favouring the development of the seizures appears probable when we consider that among individuals having organic brain lesions or some functional disturbance in their metabolism *only a small proportion* react to this abnormal condition with epileptic seizures. According to the statistics of the late war, epilepsy developed only in from four to five per cent of individuals who suffered from gunshot injuries to the brain, and this low rate was fairly constant in all the combatant forces. Collier[8] emphasizes the etiological importance of this low percentage in his Lumleian address and stated that in his experience there is no lesion of the brain, whatever be its nature or its position, that will certainly induce the development of epilepsy. On the other hand, there is hardly any lesion of the brain which may not give rise to epilepsy. Of ten tumours of the brain, identical in nature, size, rate of growth and position, one may produce epilepsy early and continuously, while the other nine fail to do so. Of twenty similar wounds of the brain, one is followed by epilepsy and the others are not. Furthermore, the irritation which may arise from special adhesions, tissue tractions, and dislocations, appears to have little definite influence in the great majority of cases. Obviously, therefore, the lesion in the brain is not the only important factor responsible for the development of epilepsy.

1. *Brain* 44: 312, (November) 1921.
2. *Lancet* **214**: 587, Mar. 24, 1928; Mar. 31, 1928; April 7, 1928.
3. *Medicine* **2**: 105-290, May, 1928.
4. *loc. cit.* p. 587,
5. COLLIER, SIR JAMES—Address on Epilepsy *Lancet* p. 1163, June 1, 1929.
6. *loc. cit.* p. 109.
7. *loc. cit.*, p. 130.
8. *Lancet*, **214**: 590, 1928.

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Hereditary or Congenital Instability

The question whether any hereditary or congenital weakness is present in the cerebral tissues of epileptics is still a matter of controversy, but in the opinion of the majority of writers on the subject we have to deal in a considerable percentage of cases with an hereditary or congenital instability of nerve centres, varying greatly in degree in different individuals. C. W. Burr[9], after a study of 1,449 cases, states that while there is no strong evidence of any direct inheritance of epilepsy, there is evidence of an inherited or congenital instability of the nervous centres manifesting itself as a predisposition to nervous disorder, the specific form of which is dependent on external causes. Brain[10] in a study of 200 cases found a family history of convulsions in 28 per cent as compared with 10 per cent in other patients attending the hospital for nervous diseases. Myerson[11] is of the opinion that a hereditary factor in epilepsy has not been proven, but there is a constitutional factor which may arise *de novo* in the lifetime of an individual from his uterine existence onward.

Physico-Chemical Changes in the Brain Cells

In addition to the possible presence of some hereditary or congenital fault in the brain cells favouring the development of epilepsy, we must also recognize the important influence that certain physico-chemical changes may have on the function of these cells. The central nervous system is vitally dependent for its normal functioning on a continued and adequate supply of oxygen, and R. O. Loebel[12] has shown that the oxygen consumption of brain tissue is specially high. Any anoxæmia of the brain tissues produces an abnormal instability in them, and if severe may give rise to convulsive seizures. Lennox and Cobb[13] think it probable that deprivation of the supply of oxygen to the cells is the common denominator of many diseases in which a tendency to convulsive attacks is a feature.

Any marked change in the equilibrium of the electrolytes will also interfere with the normal functioning of the brain cells. Both ketosis and alkalosis have a very definite influence on the excitability of the tissues.

Furthermore, the functions of all the body tissues are intimately related to their blood supply, and any interference with the supply to brain cells will lead to the development of seizures. Oedema of the tissues may have a similar action. Hippocrates noted the moist state of brain cells in animals dying in convulsions, and oedema of the brain has been advanced as an important factor in the convulsions of eclampsia.

It is important, therefore, to note that nerve cells when abundantly supplied with oxygen and with efficient nutrient material obtain the best protection against the development of convulsive attacks.

Abnormal Conditions in the Body Outside the Brain

Although our investigations thus far appear to indicate that either an organic lesion in the brain or some functional instability in the central nervous system is present in the majority, if not in all, individuals suffering from the syndrome of epilepsy, nevertheless abnormal conditions in the body outside the nervous system are now recognized as important contributing causes of epileptic seizures, and, in consequence, numerous investigations have been carried on with the object of detecting such conditions. The blood, urine and fæces of epileptics have all been meticulously examined by many, but unfortunately with no results of any definite significance. Careful observations by B. Hamilton[14] on the amount in the body fluids of chloride, bicarbonate, inorganic phosphorus, total fixed base, and of calcium in the serum and spinal fluid of epileptic patients showed all to be present in essentially normal amounts. Neither does the morphology, physical properties, or Wassermann reaction of the blood afford any evidence of abnormality which may be regarded as contributing to the occurrence of convulsive attacks[15].

Spinal Fluid. No definite abnormal condition has been found in the spinal fluid beyond the fact that during a seizure the spinal fluid pressure is greatly increased, apparently as a consequence of the apnœa, and the increase in venous pressure. Clinical evidence to indicate that an abnormal pressure of the fluid is a contributing cause of the seizures is lacking. Further investigations on this point, however, are called for. Prior and Edward[16] report beneficial results from spinal fluid drainage in patients in status epilepticus.

Vascular Spasm. The theory of vascular spasm in the cerebral arteries as a possible cause of the seizures was discussed by both Hughlings Jackson[17] and Gowers[18], but later on was thrown into discredit by the statements of Leonard Hill[19] that there were no nerves associated with the vessels in the brain. This statement of Hill's, however, has been shown to be an error and vasomotor control of the cerebral vessels is now definitely established. Acting upon the view that vaso-constriction may play a part in the causation of the seizures, removal of the cervical

9. Heredity in Epilepsy, *Arch. Neur. and Phsyc.* **1:** 721-8, 1922.
10. Inheritance of Epilepsy, *Quart. J. M.* **19:** 299-310, 1926.
11. Inheritance of Mental Diseases, Williams and Wilkins, 1925, Baltimore.
12. *Biochem. Ztschr.* **161:** 219-235, 1925. (Quoted by Lennox & Cobb, *Medicine* **7:** 140, 1928).
13. *loc. cit.*, p. 140.
14. *J. Biol. Chem.* **65:** 101-115 (August) 1925.
15. *loc. cit.*, p. 218.
16. *M. J* Australia **2:** 507, 1926. (Quoted by Lennox and Cobb *loc. cit.*, p. 189.)
17. W. Riding Lunatic Asylum Reports **3:** 315, 1873.
18. Epilepsy and other convulsive diseases. J. and A. Churchill, 1881.
19. Physiology and Pathology of Cerebral Circulation J. and A. Churchill, 1896.

sympathetic chain of ganglia has been affected, but the result of this operation has been disappointing. In one case, however, quoted by Lennox and Cobb,[20] the seizures ceased for a week after the operation, then recurred, but later on disappeared entirely.

Autonomic Nervous System. Many patients with epilepsy present evidence of a lack of balance in the autonomic nervous system. Abnormalities of the gastro-intestinal tract have been frequently accused of playing a prominent part in seizures, and undoubtedly the normal functioning of this tract is of definite therapeutic value. C. A. L. Reed[21], however, in a series of papers states that he considers epilepsy as due to a chronic toxæmia of intestinal origin, and[22] that relief has followed in numerous cases upon which he has operated and removed portions of the cæcum or colon. A notable instance[23], within the knowledge of the writer, was the case of a man who had suffered from epileptic attacks since adolescence, and who was completely freed from them by resection of the ascending colon. At the present date, twelve years after the operation, no recurrence has taken place. Infection is also recognized by many as a contributing factor, and cures have not infrequently been obtained by the eradication of some focus.

Endocrine Abnormalities Numerous investigations have been made to determine the existence of any endocrine abnormality in epileptics which might indicate one or more of them as active and important factors in the production of epilepsy, but no convincing results have been obtained. Evidence has been found in many epileptics of a slight reduction in the amount of oxygen consumed, indicating a lowered basal metabolism. The administration, however, of the glands which most actively stimulate metabolism,—the thyroids, adrenals and the pancreas—to such patients, appears to increase rather than prevent the occurrence of seizures Only a few patients suffering from convulsions show evidence of pituitary gland disturbance, antedating the onset of the convulsions, but in such the seizures appear to have some definite relation to disturbance in the gland, and improvement has followed the administration of the gland. B. R. Tucker[24] in 200 patients thought he found evidence of some abnormality of the pituitary in one-third of them. Twenty-eight of these were treated with gland substance and five were freed from seizures for three years.

The parathyroid glands hold a peculiar position, in that the three factors which, according to Collip, influence the production of experimental tetany, namely, tissue anoxæmia, disturbance in ionic equilibrium, and disturbance in the hydrogen ion concentration, may also by increasing irritability of nerve tissue precipitate convulsions in epileptics. However, although Collier in his address[25] states that he regards tetany as closely allied to epilepsy, in only the exceptional patient is there any evidence of the co-existence of tetany and epilepsy.

20. *loc. cit.*, p. 158.
21. *J. Am. M. Ass.* **64:** 1047, 1915.
22. *J. Iowa Med. Soc.* **10:** 204-208, 1920.
23. ARMSTRONG, G. E., *Practitioner*, **117:** 288, 1926.
24. *Arch. Neur. and Psych.* **2:** 192 August 1919.

ANAPHYLAXIS AND EPILEPSY

Various writers have pointed out certain resemblances between epileptic seizures and anaphylactic shock. There is little direct evidence concerning any inter-relationship between these two conditions. The two facts, however, that few epileptic patients present any reaction to skin tests, and in few do we meet with the incidence of any allergic condition such as hay fever and asthma, are certainly against the supposition that any special sensitization, or abnormal protein metabolism, is a prominent factor in any but very occasional cases.

Disorders in Metabolism

Blood Sugar. The observation that insulin hypoglycæmia in rabbits is accompanied by convulsions directed special attention to the blood sugar content in epileptics. Induced hypoglycæmia does appear to favour the development of convulsions in man, but to a much less extent than it does in animals. A slight increase in the blood sugar content may take place after a seizure as the result of the apnœa and intense muscular exertion, but there is no evidence that the blood sugar content plays any more than a passive rôle, and there is no evidence of any important disturbance of carbohydrate metabolism.

Acidosis. It is notable, however, that epileptics exhibit an unusual ability to consume and metabolize fats, and on a high fat dietary, the acid base changes induced in the blood are found to definitely lessen the excitability of the nervous centres, and in epileptics to reduce the frequency of the seizures. Ketosis may be induced by the administration of acid-producing salts, a high fat diet with limitation of the carbohydrates, or by fasting. Adult epileptics do not respond well to the condition, and it is difficult to maintain in them an effective ketosis for any time without the appearance of warning symptoms. Children, on the contrary, develop the condition on a lower ketogenic diet and respond well to the treatment. Wilder and Peterman[26] were able to keep a series of young children on a diet effective in inducing ketonuria for a long period, without any impairment of health, and with great improvement in the seizures. Helmholz[27] in the Mayo Clinic treated 91 children all under thirteen years of age, 31 per cent of whom were rendered free of attacks, and 28 per cent were definitely improved. Talbot[28] in Boston makes a similar report, emphasizing not only great reduction in the fre-

25. *loc. cit.*
26. *Mayo Clinic Bull.* **2:** 307, 1921.
27. *J. Am. M. Ass.* **88:** 2027-2032, 1927.
28. *Bost. M. and S. J.* **196:** 89-96, 1927.

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quency of the seizures but also improvement in health in children under twelve years of age on a diet in which the fat percentage was raised to over sixty per cent, the carbohydrate was restricted, and protein added to the extent of 1 gram per kilogram of body weight. We must, however, not forget that convulsions may occur even in the presence of pronounced ketosis, as in diabetic coma and in cyclic vomiting. Moreover, in time the system appears to react and the plasma bicarbonate gradually returns to normal, and the seizures may return.

Fasting as a method of checking the frequency of the seizures attracted much attention a few years ago, when numerous papers appeared detailing the good results obtained in a considerable percentage of cases treated. Those showing the greatest improvement were the ones with the highest excretion of acid. Unfortunately, with the termination of the fast the seizures recur. Lennox and Cobb report that in patients having frequent seizures and especially in children the beneficial effect of fasting is striking. Goldbloom[29] reports a case of frequent seizures which ceased during fasting, but recurred after it was stopped. It is doubtful, however, whether it is more effective than a high fat diet, which produces a similar degree of acidosis with less discomfort to the patient.

Alkalosis on the contrary has a definitely exciting influence on the nervous centres. Collier[30] in one of his addresses emphasizes this fact, and states that alkalosis may induce epileptic seizures, and that alkalosis, induced in a series of epileptics by hyperpnœa, will very promptly bring on seizures in the majority. However, in this overventilation of the lung it must be remembered that other factors enter, such as accelerated blood flow through the brain with decreased oxygenation of its cells, and a shift in the inorganic bases from blood to tissues, all tending to favour the development of convulsive attacks.

Blood Cholesterol. In a recent editorial in the *Lancet*[31] attention is called to the behaviour of blood cholesterol in epilepsy. Investigations during and after seizures indicated that its amount in the blood was unduly low. Robinson, Brain and Kay[32] reported in 1927 that cholesterol was lower in epileptics than in the controls, and in 10 cases out of 11 there was a definite fall before the seizure. In a paper published in the same issue of the *Lancet* as the editorial, Gordon, Fox and Brain not only confirmed the results obtained by previous investigators but also demonstrated a depression of the blood cholesterol during status and serial epilepsy and its instability in association with isolated fits, thus indicating the existence of a metabolic abnormality in epilepsy. A definite fact concerning cholesterol is its intimate relationship with the liver. It is secreted in the bile, being presumably removed by the liver from the blood stream. The writer in the editorial states that these observations on the cholesterol content in epilepsy assume an added significance in the light of the investigation of the lævulose tolerance test in epileptics reported by Dr. Gosden and Dr. Tyler Fox[33]. Their findings would appear to point to a severe functional liver deficiency, although as the writer remarks there is nothing in these observations to indicate a definite relationship between this disturbance and the attacks.

The Liver. Myerson, a number of years ago, observed that the weight of the liver was subnormal in a large proportion of autopsies on epileptics. This observation has since been confirmed by others. The writer in the editorial considers that there are sufficient indications to encourage energetic research into the hepatic functions of the epileptic.

SUMMARY

Lennox and Cobb in their summary of the more important advances in our knowledge of epilepsy, as brought out in their review, emphasize as one of the most important the demonstration that changes in the physico-chemical processes in the body,—and therefore also in the brain, such as anoxæmia, alkalosis and œdema, may profoundly modify the seizures in epilepsy. In any consideration of the abnormalities in the body outside the brain it is also important to recognize the inconstancy and abnormal variability in epileptics of almost all physiological processes. Variation appears to take place from day to day in the measurements of the hydrogen ion content in the blood, in the consumption of oxygen, in the blood sugar curves, in the activity of reflexes, in the stability of the sympathetic nervous system, in the excretion of ammonia, and in the nitrogen balance.

Because no constant structural lesions or abnormalities have been demonstrated in the brains or bodies of individuals subject to seizure, and because in the presence of very obvious lesions and abnormalities only a minority develop seizures, we must regard such abnormal conditions as playing only contributory rôles. The important problem still remains unsolved why, under a given stimulus, one individual should develop a seizure, and another show no sign of reaction. Further knowledge regarding the metabolism of nervous tissue and the relation which it may bear to its functions will greatly extend our understanding of the special conditions which contribute to seizures.

TREATMENT

Physicians must still regard an epileptic seizure as only a symptom, and should give full recognition to the many factors which may contribute to its occurrence. The golden opportunity to effect the greatest good is in the beginning, when the

29. *Canad. M. Ass. J.*, **12**: 539-540, 1922.
30. *Lancet* **1**: 1163, June 1, 1929.
31. **2**: 27, July 6, 1929.
32. *Lancet*, August 13, 1927, 325.326.
33. *Lancet*, June 29, 1929. (Quoted in Editorial.)

detection and correction of an exciting cause may remove the symptom, and may effect a cure. Much assistance can be obtained in the early stages by a carefully evolved history. Recognition of the fact that changes in the physicochemical processes in the brain cells and in the body tissues may profoundly modify the development of the seizures is most important. Lennox and Cobb consider oxygen lack as a *fundamental element* in the precipitation of seizures.

In some patients the careful use of sedative drugs may lessen the number of seizures, and at the present phenobarbital is recognized as one of the best. In the treatment of the status epilepticus, drainage of the spinal fluid, and the intravenous injection of 5 to 10 grains of luminal sodium is in Lennox and Cobb's opinion generally effective. Fasting may be of service at the outset, but the administration of butter, cream and emulsified oil may be early associated with it. Limited, and so called epileptic, diets have no justification, and may do more harm than good. Collier advises a normal life as much out of doors as possible. Education, pleasure and work should never be stopped, but never taken in excess. For those whose interests lead them to seek further into the nature of convulsions it may be stated that no subject of research necessitates such a broad outlook in its investigation, and such a close collaboration between the clinician, the physiologist, and the biochemist.

THE PREVENTION OF FILM FIRES*

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PART II.

In recent years much attention has been focussed on the non-inflammable film, a film produced by coating the emulsion on a cellulose acetate base instead of on a base of cellulose nitrate. While this substance will burn, it does so slowly, without explosion, and with very little heat; it will not decompose like the nitrate base. Acetate films behave and may be stored like old paper. These films now cost about twenty per cent more than the nitrate films, a margin which is not likely to lessen greatly with increased demand, due to the fact that the essential factor is the greater cost of acetic acid. Gas production on combustion is as shown in the Table below.

Obviously the acetate film is much safer and its greater cost should not be a major consideration. There is still some difference of opinion on the advisability of regularly replacing the nitrate with the safety film. Poor safety films are often encountered. The smallest impurities seem to cause grain marks, blemishes, or uneven developing. There seems to be an increased tendency to curling, shrinkage, and brittleness; also, the stock must be turned over more rapidly because, as one manufacturer explained to the writer, there seems to be, in many instances, some chemical reaction between the base and the emulsion. One large general hospital and a well known tuberculosis sanatorium have protested against being required to use them Our larger hospitals are divided in their allegiance, although the majority have decided to use safety films. One operator thinks that the two types are of equal quality when the acetate films are good, but he occasionally gets a bad batch, which is naturally annoying. Other operators are quite pleased with the safety films. Undoubtedly their increased use will crystallize our opinion, and should stimulate the manufacturer to greater efforts to perfect their production.

D.F.P.A. RESOLUTIONS ON FILMS

Apropos of this controversy, the Dominion Fire Prevention Association, at their annual meeting, held in Ottawa in July, devoted one session to this subject. Canadian Medical Association representatives, including various radiologists, were present by invitation. The following resolution was passed:

"Having given consideration to the question of safety in hospitals, clinics, and other institutions, as affected by the use and storage of hazardous nitrate film, we, the Dominion Fire Prevention Association, do recommend that the provincial and local authorities having jurisdiction immediately enact legislation making it unlawful for any hospital, clinic, dispensary, school, college, asylum, or similar institution to have in or upon the premises any nitrate cellulose sheet film intended to be exposed to Roentgen or x-rays. Any such nitrate cellulose sheet

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GAS PRODUCTION BY BURNING FILMS

TABLE

	SAFETY FILM (acetate)	INFLAMMABLE FILM (nitrate)
With abundance of air	CO_2 (1.9768 gm. per litre)	H_2O CO_2 Nitrogen (1.2507 gm.)
Little or no air	H_2O CO_2 *CO* (1.2504 gm.) Acetic acid vapour	CO_2 *CO* *Nitric oxide* (1.3402 gm.) *Nitrogen dioxide* (2.05 gm.) Nitrous oxide (1.977 gm.) Camphor vapour tarry residue

Hydrocyanic acid in minute quantities, and cyanogen $(CN)_2$ (2.337 gm.) have been noted as well in nitrate film combustion. With the exception of carbon monoxide and nitrogen these gases are slightly heavier than air (air is 1.2928 gm. per litre), but the heat generated makes them rise under ordinary conditions.

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film that may be already exposed, developed and stored upon such premises at the time this legislation becomes effective, to be stored in such place and manner as shall be prescribed and directed by the Fire Marshal or Fire Commissioner of the province."

Obviously the fundamental desire of the fire marshals was to help the hospitals to prevent fire and, from this viewpoint, this measure should prove timely and will undoubtedly meet with general approval. It has been thought that, considering the present uncertain quality of safety films, the objections raised by certain leading observers and the legal machinery whereby careful handling and storage could be enforced, a less rigid wording, providing a choice of film to those institutions observing special fire rules, might have been preferred. This recommendation will now be passed on to the Provinces for consideration. Storage of nitrate films at a distance from the main building is undoubtedly the safest procedure, although some provision may have to be made for certain city hospitals where only roof storage of valuable nitrate films is possible.

The Canadian Electrical Code has not yet bee n adopted by all of the provinces and this procedure was urged. Also, it has recommended that all public hospitals in their future construction be required to abide by the fire regulations dealing with the storage of x-ray film. Mr. Geo. Lewis, the Deputy Fire Marshal for Ontario, recommended that all cellulose nitrate films be stencilled or marked in future as "Dangerous," or stamped "Nitrate" at least.

How to Burn Films.

At this conference, A. C. MacIntyre, Ph.D., the well known authority on explosives, urged that discarded films be burned, not thrown away, for they are a distinct menace to children and others. What is the best method of destroying films? He recommended that they be laid out in a long row in an open field and that the train be fired *against the wind*. Old films can be resold, of course, to the manufacturers. Dr. MacIntyre aptly remarked that if we were to think of the films as "gun-cotton" and the vault as a "magazine" we might be more careful.

* * * * *

One cannot refrain from considering the fire hazard due to the old x-ray films which collect in the average doctor's office and are so often piled on the radiator, frequently fall behind it, are shut up in a wooden drawer or lie on the desk beside his pipe and a half-corked can of ether. We all have been guilty. Truly, the Lord is kind!

REMOTE RESULTS IN GASTRECTOMY.—An investigation has been carried out at the Middlesex Hospital, London, into the remote results of gastrectomy by G. Gordon-Taylor, R. Faughan Hudson, E. C. Dodds, J. L. Warner and L. E. H. Whitby. The investigation was started in January, 1928, and consisted in a study of 52 patients, 14 females and 38 males. As far as possible those with malignant disease were excluded; two of the series, however, were found subsequently to be suffering from carcinoma. The operation of gastrectomy had been performed on all the patients in the series which was a consecutive one, starting in 1921 and finishing in 1926. The object of the investigation was twofold: first, to contrast the pre-operative and post-operative condition of the patient from as many points of view as possible, and, secondly, to determine what effect the removal of part or the whole of the stomach had upon the digestion, metabolism, intestinal flora and composition of the blood. The authors state that in the majority of partial gastrectomy operations one-third of the stomach is left and that in some instances more than this remains. The effect of the operation on the patient was estimated by his capacity for work after the operation. Those who could do full time work without fatigue, who could eat a normal diet and enjoy good health were designated 100 per cent efficient. Those who did part-time work only or who did whole-time light duty and who took a restricted diet were looked upon as 50 per cent efficient. Of the 52 patients 40 had a pre-operative efficiency of nil, ten were 50 per cent and two were 80 per cent efficient. After operation two had an efficiency of nil, four were 50 per cent and 46 were 100 per cent efficient. Most of the patients had a good appetite and consumed ordinary meals at the usual intervals. Hydrochloric acid was found to be present in 20 per cent of the series. In 44 per cent definite anæmia was present. This was discovered only by laboratory examination and did not resemble pernicious anæmia. An increase in the blood-cholesterol and uric acid were the only abnormalities found on chemical examination of the blood. The amount of acid produced in each patient will be in a definite ratio to the amount of stomach excised. The good results following gastrectomy depend on three factors: a lower gastric acidity than normal, a less mobile stoma and a potential source for very rapid neutralization. In referring to the Polya modification of the Billroth II operation, the authors state that it has been abandoned because of recurrent ulceration. The cause of the ulceration was the fact that the blind loop of the jejunum had to depend for its protection upon the alkaline secretion of its own mucosa only, the ascent of the alkaline duodenal and jejunal contents being merely fortuitous. Both physicians and surgeons are trying to cure their patients by fundamentally similar methods; the routes which they follow are different.—*Brit. J. Surg.* April 1929.

Men and Books

THE LIFE AND WORK OF DR. GEORGE A. KENNEDY*

BY THE LATE F. H. MEWBURN, M.D., F.A.C.S.

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Looking back over a period of forty-six years in this western country, it has been a matter of regret to me that no data had been collected by Manitoba of that galaxy of men that I found in Winnipeg in 1882 and onward; men headed by Lynch, Blanchard, Kerr, Brett, Good, Jones, Chown, Donnell, the two Fergusons, McDermid, Whitesides, and others; all good men and some brilliant. It has also been a matter of regret that nothing in that line was being undertaken in regard to our Alberta men, to whom we owe so much. So that when your invitation came to present the life of one of these men, I willingly complied, knowing my limitations, but trusting to your tender mercies.

In presenting to you to-night some phase in the life of the late George A. Kennedy of Macleod, I am calling your attention to a skilful medical man, a man of affairs, a fine type of citizen, a gentleman.

Kennedy was born on April 16th, 1858, in Dundas. He was brought up in that part of the country in which Osler roamed and worked at natural history. He graduated with the degree of M.B. from Toronto in 1878, as silver medallist, and one year under age. He was a hospital interne at Hamilton for six months, and then obtained his commission in the Mounted Police in the autumn of 1878. He came west by way of Salt Lake, Fort Benton, and then across country to Fort Macleod. He was then not yet twenty-one years old. He moved about the country from post to post, including Fort Walsh, Calgary, and back again to Macleod in 1884. In 1887 he left the Police and went into general practice. This was forty years ago.

Kennedy was instrumental in the formation of the North West Territories Medical Association in 1890, and delivered the first presidential address. He was at one time the Vice-president of the Canadian Medical Association. From 1897 till 1905 he filled the post of Inspector of Hospitals for the North West Territories. He was identified with the medical work on the construction of the Crows' Nest Pass Railway, and was Division Surgeon for the C. P. R. from the time that railway took over from the construction company till 1913. He was President of the College of Physicians and Surgeons of the North West Territories from 1902 till 1907. In 1908 he was appointed to the Senate of the University of Alberta. He was elected to the General Medical Council of Canada in 1913.

Kennedy was one of the four men who toured the west, especially British Columbia, preaching and organizing the Western Medical Federation. The four were Brett, Kennedy, Milroy, and Patterson, the two last from Winnipeg. It was this move that made Ontario and Quebec drop their opposition to the Roddick Bill. The Bill passed, and the Dominion Medical Council of to-day is the result. You can see from this summary that my statement that Kennedy was a man of affairs is well substantiated.

In 1889—again let me draw your attention to the fact that it was nearly forty years ago—the Canadian Medical Association held a meeting in Banff. It was a large and successful meeting. There were a number of distinguished men from the United States as visitors, and Montreal and Toronto were especially well represented. Wheeler, of Cincinnati (the alternative man in case Osler refused Johns Hopkins), Connors, a well known bone and joint surgeon, Macey, of Boston, and others were among the visitors present at this meeting. It was then that Kennedy read a paper on the climate of Alberta and its relation to the cure of tuberculosis, and also touched upon the fever of the country. From this address, and one delivered a year later as President of the Alberta Medical Association, I will quote extensively, intending to show Kennedy's trend of thought, his lucid and clear expositions, his knowledge of the subject, his general knowledge of men and his high ideals.

The first paper produced a profound sensation in this meeting. The members of the Association, after leaving Winnipeg, had travelled through wild appearing, sparsely settled, country to the mountains. Such a paper, beautifully put together, well reasoned, coming from a comparatively young man living in the country, was unexpected and took them by storm. At that time overtures were made to him to return east and practice in Montreal, but he refused. He had the call of the west and he was faithful to that till his death which occurred in 1913.

Kennedy was much interested in the climate of Alberta and its application to the treatment and cure of tuberculosis, and also in the origin and real nature of the fever of the country that went by the name of "Mountain Fever."

In 1886 Kennedy made an attempt to have collected detailed reports of all cases of fever occurring throughout the North-west, so that the special features of each district might be better known. It was a matter of regret to him that his motives were misunderstood, and that his efforts were frustrated. He evidently thought

* Read before the Calgary Medical Society, February 7, 1928.

that malaria was really present, and was one form of the fever of the country. He wrote as follows: "It is a matter of regret to me that my suggestions were not adopted, for I am not one of those who believe that we have reached the sum possible of attainable knowledge with regard to malaria. We owe much to the researches of Tommasi-Crudeli, Celli, Klebs, Laveran, Osler, and Carter in tracing out the life history in the blood of the malarial plasmodium. I believe the future has still something to unfold to us of its nature, mode of action outside of, and entrance into, the human system. I believe that we have much to learn of the relations between the paludal and typhoid poisons, and I believe that more care in the diagnosis, which is now rendered somewhat easier by the application of Ehrlich's test, more thoroughness in the recording of cases, and more attention to etiology, will help us to clear up the doubtful points."

Secondly, as to climate, Kennedy recognized that in a country almost equal in area to Russia there must be diversities of climate, so that he limited his remarks to "that strip of country lying along the eastern base of the mountains, and more particularly the southern part of this, bounded, say, on the north by the C. P. R. I make the eastern a line drawn north and south through Lethbridge, although for all practical purposes this line can be extended as far east as Medicine Hat. On the south is the international boundary line, and to the west the summit line of the Rockies and British Columbia." This was southern Alberta, embracing an area of one hundred and fifty square miles of mountain, foothill and prairie. He described this territory in a graphic manner as follows: "It is intersected every few miles by mountain streams, where clear and sparkling waters, rippling over their gravelly beds, are as yet unpolluted by the filth and garbage of more thickly settled communities. Its general character is treeless, save along the valleys of these streams, which are fringed by willows and cottonwood, and on the sides and bases of the mountain, whose rocky framework is clothed by the grateful germ of the spruce and fir. To the outside world this is known as Canada's grazing country, whence England will draw a large part of its future beef supply. It has also been known, in a general way, that it was reputed to have a milder climate than the rest of the North West Territories."

He had seen only two cases of phthisis commencing in the country. One was an acute tuberculosis, strongly hereditary, and the other was fibroid, the cause of which he believed to be the fine dust of the corrall acting in the same manner as in stone-mason and knife-grinders' phthisis, and on ceasing this work the patient ultimately recovered. He had known many cases of incipient consumption that had come to Alberta. In some the disease had been arrested; others had been restored to health.

He drew attention to the fact that elevation was not then considered so essential in the climatic treatment of phthisis. In southern Alberta the elevation ranges from 2,000 to 5,000 feet, so that the patient could choose the locality which best suits his case.

Authorities have made it clear that a dry soil must be a necessity for any place putting forward claims as a resort for phthisical patients. Southern Alberta possessed that feature to an extreme degree. A more important point than the foregoing was the number of days during which patients can take exercise in the open air. Kennedy had evidently kept a record for five years of the days recorded as: overcast, raining and storming. The figures for these five years were respectively: 51, 49, 56, 53 and 44, or an average of a fraction over 50 of these days per year.

He drew attention to the fact that the climate of southern Alberta was such that the patient could live in it all the year around. That, being stock raising country, it was possible to spend almost all one's time in the saddle. He quotes Sydenham, who said that "Unlimited horseback riding exercise is almost as good a cure of phthisis as quinine is for ague." At the end of the paper, Kennedy's Canadianism came to the fore. He asked why should Canadian physicians send their patients to Colorado when they have a climate equally as good within the confines of their own Dominion.

In an address delivered as President to the first meeting of the Northwest Territories Medical Association just formed— it must have been in 1890— Kennedy divided the work of the Association into two sections, the scientific work and the practical or administrative business. He drew attention to the fact that Manitoba, with all its advantages, was just about to launch a provincial association, so that it was to Alberta's credit that it had organized the first provincial association of Western Canada. He enunciated the purposes of the Association to be (1) the intercommunication of ideas; (2) the scientific discussion of medical and surgical subjects; (3) the elevation generally of our noble profession. He drew attention to the difficult road that the Association would have to travel, but he said difficulties were made to be overcome, and that the members were young and not of the stuff of which failures were made.

One of the conditions requiring attention at that date was the treatment of the insane, who were in those days placed in jails and police guard rooms for weeks and months until their cases were disposed of by the Lieutenant-Governor, and then ultimately sent to Stony Mountain Penitentiary. He made a strong appeal for the better treatment of the insane, and urged the Association and its members to be "up and doing."

He next drew attention to the sanitation, or the want of it, in the small towns and villages that were beginning to spring up all over the prairies. He said "We must not forget that

while our lives are devoted to the alleviation of suffering and the cure of disease, our highest duty is to prevent disease, to act as guardians of the public health, to keep the enemy always on the outside." This was a hint of the coming of preventive medicine. He felt and saw it coming.

Then, as now, the want of population was pressing. He urged the association as an association, and its members individually, to do whatever they could to bring the province and its advantages to the notice of the outside world. He again took up the subject of the diseases of the country, urged the members to keep record of their cases with treatment and investigations, and to bring them forward to the Association's meetings for general consideration. He thought that by some such means definite information could be obtained.

His mission was, of course, that of a doctor, and it was the manner in which he entered into and carried out his professional work that brought him recognition as a skilful and trusted medical man. Wonderfully observant, working out his cases well, and careful in details, he gave the best he had to his patients, with great judgment and sympathy, so that he was looked up to, and was accorded the respect and confidence of the whole country. The extent of country over which he travelled was enormous. Roads were trails, habitations few and far between, treacherous rivers had to be forded, and at certain seasons of the year, especially in the foothills of the mountains, storms were apt to arise, as they do now, and catch the traveller. Horses and buckboards were the means of transportation. In the matter of professional assistance he was alone for years. Yet he was able to do this arduous practice and still have time to read and think things out and keep abreast of the times. He had a well organized mind, as is shown by the papers from which I have quoted, by his reports while in the Police which I have been able to read, and by his work which at times I was able to see and discuss with him. You must remember that he graduated in 1878, (he graduated before I did), and at the time of his graduation Toronto had not accepted Listerism. In this connection the following is interesting. A meeting of medical men from all over America was held in Philadelphia, at which Lister was present and spoke. In the discussion Dr. Canniff, of Toronto, spoke at some length and in the course of his remarks said "I may say that the practice recommended by Professor Lister has not been adopted in the Toronto General Hospital. His doctrine is not as yet acted upon, and I feel safe in saying that the success attending the treatment of wounds in that institution is not exceeded by that in any other." So you can imagine that Kennedy did not have much grounding in antiseptic surgery during his student course. Yet, when I first met him in 1886, he was quite at home in the theory and practice of antiseptic surgery. It is interesting to remember that, for eight years after his graduation, he had been living cut off from his professional fellows, and journals were not so numerous or so easily procured as to-day.

Some of his cases have left a lasting impression on me. One was a case of a bullet wound of the chest, the bullet having entered about the second rib and torn its way out at the angle of the scapula on the other side. How the great vessels escaped was marvellous! During the progress of the case many surgical conditions presented, but they were successfully met and the patient is alive to-day. Such cases then were extremely rare and those that did occur generally died. There had been no Great War to improve our methods or knowledge. Another case was a compound fracture of the tibia, followed by osteomyelitis, with the loss of about two inches of bone. Kennedy followed the practice of the celebrated French bone surgeon, Ollier, of Marseilles. The wound and soft parts were well cleaned. The bone of the leg of a dog, killed for the purpose, was cut in small pieces and the gap filled in and a carbolic dressing applied. It did badly. Later, it was found that this had been the experience of Phelps, of New York, a well known bone surgeon, who had done his case a few months previously, but of which Kennedy was unaware. The man afterward got a very useful, strong leg. The fibula was shortened two inches, which allowed the ends of the tibia to be approximated and held together by an ordinary wire nail. Bear in mind that this was nearly forty years ago. Those were the days when surgery was groping in all directions, spurred on by inquiring, progressive minds.

Here was a young man, not yet twenty-one, coming into a new country, in a position with all his material wants supplied, and occupying by force of circumstances a very prominent position in relation to the health, and otherwise, of a vast extent of territory. What greater temptation could there have been to settle down to an ordinary routine medical life and to have travelled in a rut? But his life bears witness to the very reverse. Kennedy has always impressed me as a man belonging to the class typified by Sir James Mackenzie, a class that does good advance work, and at the same time attends assiduously to the ordinary routine of a general practice. He read widely outside his profession, and to that fact I attribute the success of his efforts.

He was honest and direct in his criticism, perfectly ethical, with at times a blunt manner but underneath was a large, warm, responsive heart and an earnest desire to be of assistance in cases of suffering and all good causes. He was fond of sport, and a good companion and conversationalist. He, with his wife, kept what might be truly called open house. Their hospitality was unbounded, and many men driving or riding the prairies asked their tired horses to do a few extra miles, that they might enjoy that

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hospitality and all that it meant. I know that from personal experience.

In conclusion, let me state that in those days before population began to roll in the lives of men were highly idealized. That ideal was compassed in the two words "White Man." Men were elevated to that class by their fellows, not by canvassing or electioneering but by their mode of ordinary every day life and all that went with it. Kennedy was one of these "White Men" of the country. He always lived up to it, never faltered, and never broke faith with his fellows. With his optimism, his imagination, his patriotism, his imperialism—imperialism in the wide sense of the term as a confederation of nations influencing the peace of the world—with all his work, Kennedy will take his place with those men who in the early and succeeding days, under stress and strain and many difficulties, laid the foundation, materially and intellectually, of the life we are enjoying to-day.

HUMPHRY DAVY, A GREAT NATURAL PHILOSOPHER

The centenary of the death of Sir Humphry Davy occurred last week. It will be commemorated at Penzance on Saturday.

Born at Penzance in 1778, Humphry Davy went to the local grammar school, read whatever came his way, was fond of telling stories and making verses, dabbled in mechanics and electricity under the guidance of a Quaker friend, but, fortunately, as he thought himself, was left much to himself and put upon no particular plan of study. He was little more than sixteen years old when he was apprenticed to Dr. Borlase, a surgeon in Penzance, and he atoned for any previous desultoriness in his education by drawing up a most ambitious scheme of self-instruction in preparation for the profession he had chosen. It was at this time that he accidentally made the acquaintance of Davies Gilbert, always his very good friend and afterwards his successor as President of the Royal Society, who, it is said, saw him swinging on the half-gate of Dr. Borlase's house and entered into conversation with him. Through Gilbert he got not only the run of a laboratory belonging to Dr. Edwards, of Hayle, but also an introduction to Dr. Thomas Beddoes, who gave him his first professional appointment.

During the latter part of the 18th century great progress was made in the discovery, or identification, of gases, both elementary and compound, and not for the only time physic found in the advances of physical science the hope of useful additions to its armamentarium. Beddoes was one of those who thought that "factitious airs" would prove valuable as medicinal agents, and in pursuance of this idea he established his Pneumatic Institution at Bristol. Davy, then barely twenty years of age, was engaged to superintend the experiments, and was thus put in command of a chemical laboratory.

Among the experiments Davy made at Bristol the best known are those on laughing gas (nitrous oxide). He records that on one occasion, after breathing sixteen quarts of it for nearly seven minutes, he was absolutely intoxicated and danced like a madman. Thereafter the inhalation of the gas seems to have become something of a fashionable amusement. Davy's work at Bristol had brought him into prominence, and the result was that Count Rumford, needing a chemical lecturer for his new Royal Institution, secured him for the post, at a salary of 100 guineas a year, with a bed-sitting room in the house and coals and candles found. He entered upon his duties in 1801, and the dozen years he spent at Albemarle Street were undoubtedly the most fruitful period of his life The voltaic battery, invented a year or so before, had come, in his own words, as "an alarm bell to experimenters in every part of Europe," and no one made a more brilliant use of the new instrument than he did. His preparation of metallic potassium and sodium in 1807 by the electrolytic decomposition of potash and soda was, perhaps, the most spectacular result he obtained with its aid, but the Bakerian Lecture on "Some Chemical Agencies of Electricity," which he delivered before the Royal Society in the previous year, represents achievements of far greater intrinsic importance.

Throughout the time he spent at the Royal Institution, during which he made many other notable discoveries, and some mistakes, he proved an extraordinary success as a lecturer. He was able to make science a fashion and the Institution a vogue. But in 1812 there came a change. Within the space of a week he was knighted, gave his farewell lecture (though he remained as Professor of Chemistry without the obligation to lecture), and married a rich widow, Mrs. Apreece, a distant cousin of Sir Walter Scott.

After his marriage he wrote his "Elements of Chemical Philosophy," which like others of his works bears the marks of hasty composition under the spur of his love of glory, damaged an eye by an explosion of chloride of nitrogen, and departed with his wife on a long continental tour through France, Italy, Switzerland and Germany. At Paris he was fêted by the galaxy of men of science then resident in the French capital, and with the aid of his portable chemical cabinet—the Chemical Philosopher in "Consolations in Travel" remarks a little naively that some of the best and most refined researches of modern chemists have been made by means of an apparatus which might with ease be carried in a small travelling carriage—put them right about the nature of iodine, which one of them had recently discovered; at Genoa he made experiments on the electric ray or torpedo; at Florence he burnt diamond by the sun's rays concentrated through the great burning glass at the Accademia del Cimento and proved it to consist of carbon; he made several ascents of Vesuvius; he met Volta, who, himself arrayed in full Court uniform in honour of the occasion, was aghast at the

careless dress of the distinguished visitor; and at Geneva he investigated the heat of the infra-red rays of the spectrum. Throughout the tour Faraday formed one of the party.

Soon after his return to London in 1815 Davy busied himself with one of his most notable contributions to the quantity of human happiness —the miner's safety lamp—and the assiduity with which he laboured at this task is attested by the large collection of models preserved by the Royal Institution. In recognition of his work the Northumberland coalmasters subscribed to present him with a silver dinner service, which, under his will, ultimately passed to the Royal Society and was melted down and sold, the interest on the proceeds providing the annual Davy medal. In 1818, the year in which he was made a baronet, he again went to Italy and worked at unrolling papyri from Herculaneum. Returning to England in 1820, he was elected President of the Royal Society, although his predecessor, Sir Joseph Banks, had thought him rather too lively for that august position. In that capacity he took an important part in founding the Athenæum, and it was to him that Croker, to whom the idea of the club was due, first definitely proposed his plan.

Later his health began to fail. After a slight paralytic stroke he was ordered abroad early in 1827, but returned to London in the autumn and occupied the winter in composing "Salmonia, or Days of Flyfishing," which is obviously modelled on "The Compleat Angler." In the spring of the following year he again went abroad, and spent the winter in Rome, where, a "ruin amongst ruins," he wrote "Consolations in Travel," containing, as he said, the essence of his philosophical opinions and some of his poetical reveries. In February, 1829, he had another stroke, but under the care of his brother, Dr. John Davy, rallied sufficiently to be moved to Geneva, only to die immediately after his arrival.—*The Weekly Times*, June 6, 1929.

Hospital Service Department Notes

CAN STAFF MEETINGS BE MADE ATTRACTIVE?

PREPARED BY THE DEPARTMENT OF HOSPITAL SERVICE OF THE CANADIAN MEDICAL ASSOCIATION

This is approaching the time of year when the flaming hues of Indian summer bid us turn back reluctantly to the more serious interests of life. Perhaps, as medical men, we should refer to this season as St. Luke's summer. Again our thoughts revert to the many clinical problems which were left unsolved last spring, and which are to be attacked with renewed vigour this autumn. Hospital staff secretaries are judging the optimum time to call the first "free-for-all" on the subjects of "When is a peptic ulcer surgical?" or "Will diathermy help pneumonia?"

Why are some staff meetings absorbingly interesting while others are so dull that they are attended only when all excuses have been exhausted? Why are some hospital staffs so keenly alert and progressive, while others "drift gently down the tides of sleep," without cohesion or co-operation, many of their members still using the methods generally abandoned many years ago? Yet one can hardly blame busy delinquents for "forgetting" meetings which have no definite program, never start on time, are dry and uninteresting, and seldom manifest the social possibilities of such gatherings. This is unfortunate, for a proper staff organization is absolutely essential if a hospital is to give the most efficient service to the public. Moreover, such organization enables us to pool our experience and knowledge, crystallize our opinions, and simplify our diagnostic problems. The New Year's message of the President of a great Canadian university to his students to "clarify your ideas by discussion" is a timely one, worthy of the consideration of every medical graduate.

WHY INTEREST LAGS

For some time now, the writer has had the privilege of attending hospital staff meetings in various parts of Canada. These visits have afforded an unusual opportunity to compare types of meetings and to observe what methods have been found by actual experience to be productive of most interest and enthusiasm.

The type of program is of fundamental importance. All too often, it is somewhat soporific. The review of the deaths for the week, or the month, is a most desirable feature, but the list should not be hurriedly recited to a yawning audience who are either not interested or who follow the list with knowing nudges or winks at the expense of the doctors mentioned. Nor should this rendition be followed by the customary period of silence, not maintained out of respect for the dead, but due in part to the usual absence of the doctors concerned, or partly to the fear that some question or remark may be construed as malicious by the sensitive doctor in charge of the case. There seems to be a general impression that the doctor must *defend* himself, must submit to cross-questioning and be asked about basal metabolisms, concentration factors, platelet counts, and other studies often of questionable value in the case concerned.

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IMPROVING THE PROGRAM

The study of the mortality lists can be made of unusual interest if the discussion be centred on those cases which illustrate *interesting symptoms, diagnostic signs and complications, or about which the therapeutic procedure is debatable.* If differences of opinion be kept upon a friendly and respectful plane, controversial points can be argued and debated to the intense enjoyment of all present. If clinical judgment is to progress, personalities must be forgotten, and all individuals become "pachyderms" in the interest of science. A heavy responsibility is laid upon the chairman, for he is the helmsman who must guide this craft between the shoals. Many staffs leave all suggestions of incompetence, faulty judgment, unethical or unwarranted procedures, etc., to a special committee of senior members or heads of services, rather than have such unpleasant matters aired in a general meeting. Certainly, any difference of opinion arising in a staff meeting should never be quoted outside of the staff meeting, or used in any unfair manner to embarrass the individual concerned.

The staffs of *small hospitals* located in rural communities often find difficulty in studying actual cases, either *ante mortem* or *post mortem*, for various and obvious reasons. A number of such small staffs have solved their difficulty by devoting a part or all of certain programs to the study of borderline or cultural subjects. Historical medicine is a most fascinating study, and the ferretting out of information concerning the local medical pioneers would provide exceedingly valuable data for our recently formed Section of Historical Medicine. A demonstration of biological specimens, travel talks, an evening with the philosophers or with the stars, would provide excellent diversion to supplement the usual clinical program.

A number of clinical societies have found it helpful to appoint a program committee to arrange the meetings. Various members are warned to be prepared to lead the discussion on various subjects. Doctors are encouraged to show interesting or problem patients from their outside practice. Practical experience has proved that most private patients are more than willing to go to the hospital for such a purpose. Many are glad to get the free consultation. Such "outside" patients should never be kept waiting.

"AND NOW, FORSOOTH, TO THE BREAD, THE CHEESE AND THE BEER!"

If one single factor can break down suspicion and jealousy and introduce a new era of co-operation and *esprit de corps*, it is the staff luncheon. There is nothing like a bowl of soup or a search for the cheese knife to break down the last barrier between confrères. Some hospital staffs prefer a noon luncheon, others, a dinner in the evening; with some, a late supper following the meeting is favoured. A few staffs hold their clinical meeting before the luncheon and listen to music or a guest speaker after they have dined. The speaker may be a visiting physician or an outstanding layman.

One of the problems of many hospitals is to gain closer co-operation in viewpoint and interest between the medical staff and the board of trustees. Again the festive board has come to the rescue in several institutions. Joint luncheons of the two bodies, held two or three times a year, should be a feature of the program of every clinical society. Also, where two hospitals with separate staffs are in the same or adjoining towns, entertainment of one staff by the other should be encouraged.

If the hospital has adequate accommodation, meetings should be held there, to facilitate clinical study, but frequently the local hotel must be chosen, especially for luncheon meetings. Guest speakers from medical centres help to broaden the medical viewpoint, but the local staff should be encouraged to participate as much as possible. The more interesting of these case reports and comments could be recorded in the provincial Bulletin or the *Journal* of the Canadian Medical Association. It is preferred, as a rule, that more formal papers or essays be read at a meeting of the local County Society rather than at a hospital staff meeting.

SELECTION OF OFFICERS

It is important that officers be carefully chosen. They should be selected not necessarily upon a basis of seniority, but because of their interest in staff welfare, their tact, and their influence with their colleagues. The presidency should rotate at frequent intervals among the more active senior men, but it is too vital a post to be entrusted to one who does not appreciate its responsibilities. This office should be quite separate and distinct from any clinical appointment, and should not entitle its incumbent to any clinical authority beyond his usual staff seniority. Where an associate, or courtesy, staff exists, the presidency is limited, as a rule, to active or full staff members.

The secretary and the members of the program committee are frequently chosen from among the younger members who still have sufficient time to implement their visions and ideals with time-consuming executive service. The personnel of other committees should be so chosen and rotated so as to give practically every member, especially the delinquents, some duty. A constitution supplementing the regular staff rules and regulations is usually adopted, in order to define the scope of this clinical society, which is within but distinct from the duly appointed hospital staff.

SHOULD ATTENDANCE BE COMPULSORY?

Various measures have been adopted to ensure attendance. Some hospitals drop a doctor from the staff if he is absent a certain number of times without just cause. Others post the names of delinquents (attendance, fees, or both) on the bulletin board. However, harsh measures result in but half-victories and a wiser procedure is to make the meetings so interesting and so valuable

that no member will even think of missing a single session. Notices and programs can be sent out by the hospital stenographer. Doctors, whose cases are to be discussed, should be notified by letter several days in advance and reminded by telephone on the previous day, or that morning, if it is to be an evening meeting. A few hospitals make it obligatory that each member of the active staff prepare at least one paper or report each year.

Finally, one should bear in mind the interest which can be aroused by that spring and fall hospital golf tournament, with the dubious handicaps, and the gay dinner when the prizes are distributed and the battle retold in movies; the bridge and dance, when the wives get acquainted; and the bowling tournament where years prove no handicap "There are more ways than one to kill a cat" or to revive a staff which is "full of a sweet indifference."

HARVEY AGNEW

ADDING NEW LIFE TO SURGICAL TOOLS BY PLATING WITH CHROMIUM

The process of applying chromium in plate form to other metals was developed only a few years ago to the point where it could be used with commercial success. Manufacturers of numerous varied products quickly adopted it to give added beauty and durability to their products. Little was it realized at this time, however, that chromium plating would come to mean so much to the hospital and its surgeons in preserving surgical instruments in proper condition.

Typical products, in addition to surgical instruments, that are plated with chromium to-day are plumbing fixtures, bathroom and kitchen fittings, printing rolls, stainless steel, hinges, door knobs, golf club heads, automobile head lights, radiators, bumpers, crankshaft bearings, piston pins and other parts, marine hardware and fittings, and even cigar lighters, belt buckles and vanity cases. Other examples are parts of manufacturing machinery receiving tremendous wear and used in the oil, textile, rubber, tool and other industries. An interesting use is for the reflectors in acetylene lamps, which are soon dimmed by fumes unless they are chromium plated.

The wide diversity of chromium plated products reveals the reason why this lustrous surface covering is widely preferred. In the first place it makes a beautiful finish, and one that requires no polishing, but simply wiping. In the second place, chromium plating provides a durable and impervious metal surface. It ranks next to the diamond in hardness. It does not tarnish or stain. It is nine times as hard as nickel, five times as hard as the best steel. It does not peel, chip, check or blister and is not affected by sterilizing solutions or heat up to 600° F. It melts only at 2,700° F. It is not affected by organic acids, and by only two mineral acids, hydrochloric and sulphuric, by the latter but slightly.

Many hospitals have tried the experiment of having old surgical instruments reconditioned and chromium plated. (*Modern Hospital.*)

Note.—In the purchase of certain plated surgical instruments subject to considerable hard usage, such as scissors, forceps, etc., hospitals would be well advised to specify "chromium plated." This is worth the slight additional cost and, for many instruments, no additional charge is made. [ED.]

Medical Societies

NEW BRUNSWICK MEDICAL SOCIETY

The New Brunswick Medical Society held its annual meeting in Saint John, July 16th and 17th. The attendance was larger than usual and the business of the Society was of more than usual interest.

The matter of a new schedule of fees and ethics was in the hands of a committee during the past year. This committee was composed of: Drs. V. Davidson, Chairman; A. S. Kirkland and R. M. Pendrigh. The schedule of fees, as recommended by this committee, was adopted after a great deal of discussion. The chief opposition to the fee list developed among the country practitioners, who declared that it was impossible to maintain fees which were justified in urban practice. This stand was concurred in by some of the city practitioners. In the discussion, it was advised that any cases where the fee had to be cut to meet the circumstances of the patient it would be advisable to bill the client for the full amount, and, if necessary, to reduce the fee. This would show the patient the amount of services he was receiving, and would be a deterrent to actual fee-splitting.

The second matter of general interest was the submission of a new scale of fees arranged between the Society and the Compensation Board. The matter had also been handled by a special committee composed of Drs. J. M. Barry, A. S. Kirkland and V. D. Davidson. The new schedule of fees, it is felt, will, on the whole, be satisfactory. As nearly as possible a fixed fee for a certain injury has been adopted, the sliding scale of fees, previously in force, having been done away with. The fees for major work have, in most cases, been increased. The debate centred about the amount chargeable for minor surgery. This type of work has been a standing source of friction in the past, and has lent itself to abuse in the hands of some men, necessitating arbitrary taxing of bills by the Board. The new schedule was finally accepted in this connection. The committee which negotiated the schedule was

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appointed a buffer committee for the next year. All disagreements between the physician and the Board are to be handled by this committee. It developed in the negotiations that the Compensation Board were most reasonable and willing to meet the physician's viewpoint wherever possible.

Another item of interest was a prolonged discussion *re* the possibility of appointing a full-time secretary. It was felt that, at present, even with the generous aid offered by the Canadian Medical Association, it would be impossible to finance such a secretary.

The scientific program presented several papers of general interest.

Dr. Eugène St. Jacques, Montreal University, read a paper on "Splenomegalies," which was extremely interesting and brought out a discussion, chiefly by Dr. G. A. B. Addy, who presented several cases of his own. Dr. R. R. MacGregor, of Queen's University, presented a paper on "Infantile nutritional disturbances." This paper had a direct appeal to the general practitioner, and Dr. MacGregor's initial appearance in New Brunswick provided a delightful contact with many new friends here. Dr. Norman S. Shenstone, of Toronto, synopsized and discussed the old and new methods of "The treatment of empyema." Dr. Grant Fleming, McGill University, presented a moving picture demonstration of a periodic health examination.

The thanks of the Society were expressed to all these gentlemen from outside who materially assisted in making the meeting a success.

Papers by local speakers included one by Dr. Mabel Hannington regarding the mentally defective, and one by Dr. E. J. Ryan on the treatment of gonorrhœa.

The Saint John Medical Society entertained the visitors from outside the city at a dinner on the first day of the meeting. The Chairman of the local society, Dr. A. S. Kirkland, presided.

The election of officers for 1930 resulted as follows:—

President, Dr. A. S. Kirkland, Saint John; *Vice-President*, Dr. R. W. Earle, Perth; *Second Vice-President*, Dr. Alex. Bell, Newcastle; *Treasurer*, Dr. V. D. Davidson, Saint John; *Secretary*, Dr. J. R. Nugent, Saint John; *Additional Members of the Executive*, Dr. R. M. Pendrigh, Saint John; Dr. J. A. MacNaughton, Moncton; Dr. B. Robertson, Keswick Ridge; Dr. P. Laporte and Dr. C. J. Veniot, Bathurst; *Additional Members to the Executive of the Canadian Medical Association*, Dr. G. Clowes Van Wart, Dr. W. F. Roberts, Dr. L. G. Pinault, Dr. D. C. Malcolm.

As a place of meeting for 1930 St. Andrews was chosen. The 1930 meeting will be the 50th Anniversary of the New Brunswick Medical Society. At this meeting it is hoped to entertain as guests the Medical Society of the State of Maine and visitors from Nova Scotia and Prince Edward Island.

A. STANLEY KIRKLAND.

University Notes

Aberdeen University

At the summer graduation at the University of Aberdeen on July 3rd, when a number of medical and other degrees were conferred, Principal Sir George Adam Smith commented on certain features of the past session. The total number of matriculated students was 1,385. The figure for men students had risen by 33, but there were 41 fewer women students. In the Faculty of Medicine there were increases in respect of both sexes; the total of 294 (263 men and 31 women) contrasted with 233 in 1927-28. The year had witnessed several notable additions to the medical and scientific resources of the city, with all of which the University was more or less associated. The new Hospital for Sick Children had been completed and opened upon its portion of the ample site acquired for the great Aberdeen Joint Hospitals scheme. The Principal added that it was fitting that they should congratulate Lord Provost Lewis on the success of his endeavour to raise £400,000 for the new Royal Infirmary, as well as on the honour recently conferred upon him by the King. In close connection with the Rowett Institute for Research in Animal Nutrition, an Imperial Bureau was being founded which would be the centre for recording and classifying researches in that subject and their results throughout the British Empire. Again, in addition to the Aberdeen Laboratory of the Scottish Fishery Board, the National Department of Scientific and Industrial Research was to open another laboratory, which would enlist the co-operation of different University departments such as that of bacteriology; it was confidently hoped that this new development would be of benefit to the science of ichthyology as well as to the fishing industry of the country. Lastly, the Scottish Department of Agriculture had arranged to establish in Aberdeen an institute of soil research; this would be named the Macaulay Research Institute in recognition of the munificence of the distinguished Canadian, a native of Aberdeenshire, who had rendered its establishment possible. In all of these directions Aberdeen and the North of Scotland were to be

congratulated upon the increase of their scientific and educational facilities.

University of Melbourne

Professor Frederic Wood James, D.Sc., M.B., F.R.S., has accepted the invitation of the council of the University of Melbourne to the Chair of Anatomy, in succession to Professor R. J. A. Berry. He will take up his duties in March, 1930. Professor Wood Jones held the Chair of Anatomy at the University of Adelaide from 1919 to 1926, when he was appointed to the Rockefeller Professorship of Physical Anthropology in the University of Hawaii, Honolulu.

Topics of Current Interest

THE THERAPEUTIC USE OF CARBON DIOXIDE

By G. Harvey Agnew, M.D.,

Hospital Service Department,
Canadian Medical Association,
Toronto

Although carbon dioxide is one of the most familiar of our chemical substances and its properties are known to every medical student, the therapeutic application of these properties has not been as general as one might have anticipated. Everyone knows that carbon dioxide is an unusually powerful stimulant to the respiratory centre, but its use in actual practice as a respiratory stimulant is not widely recognized. This observation has been impressed upon us while visiting hospitals throughout the various parts of Canada.

Some ten years have passed since Henderson, Haggard and Cobourn[1] recommended the use of 5 per cent carbon dioxide in oxygen as a respiratory stimulant in anæsthesia. It had been recommended in 1912 by MacCurdy[2] as a means of increasing the blood pressure during the shock of operation, but Henderson and his co-workers considered carbon dioxide from another physiological viewpoint, namely, its ability to increase the depth and frequency of the respiratory rate. Since that date, it has been used in many hospitals in Canada and the United States, either as 5 per cent carbon dioxide in oxygen, a mixture which can be readily obtained from various supply houses, or in the pure state in cylinders which can be suspended from the yoke of the anæsthesia machine and the gas then mixed with oxygen, nitrous oxide, or ethylene as desired by the anæsthetist.

The following advantages have been demonstrated repeatedly:—

1. Breath-holding, shallow breathing, and resultant cyanosis have been eliminated.
2. There is an increase in the rate of ether absorption.
3. The sedative effect of morphia can be obtained without the depression of the respiratory centre which so often accompanies morphia administration.
4. There is a lower concentration of ether vapour.
5. In light anæsthesia, there seems to be greater relaxation.
6. Induction is more pleasant to the patient.
7. The patient can be readily de-etherized and revival hastened.

Its Use in Obstetrics

Carbon dioxide in oxygen has proved very helpful in the resuscitation of the new-born. It is much more certain in its effect than some of the methods of artificial respiration now taught to obstetrical students. One Canadian hospital, which recently installed this mixture of gases in its obstetrical department, reports that three infants who would most certainly have died without this therapeutic aid were stimulated thereby to natural respiratory movements and their lives saved. With infants, it is customary to introduce the carbon dioxide in oxygen either through an oral catheter or with a mask. Simultaneously, gentle artificial respiration is practised to draw the carbon dioxide into the infant's lungs. As soon as natural respiration has started, the mixture is withdrawn. Owing to the delicate nature of the lung tissue, care must be exercised that the gas pressure be very low. Recently it has been recommended that carbon dioxide in oxygen be administered to the mother just as the head comes over the perineum. Breath-holding is thus minimized and the accoucheur finds it less difficult to save the perineum.

This mixture has proved of value also in carbon monoxide poisoning, freeing the blood of the poisonous carboxy-hæmoglobin by increased lung ventilation; and it has been used with excellent results in severe morphine poisoning where the respiratory depression is very marked.

Some hospitals purchase 5 per cent carbon dioxide in oxygen in large cylinders under high pressure and use a reducing valve to lower the pressure sufficiently to permit administration. It is well to bubble the gas

through a bottle suspended from the side of the tank, so that the rate at which the gas passes through the nasal catheter can be noted. Where a tank of the pure carbon dioxide is suspended from the nitrous oxide machine, it is well to remember that 5 per cent of carbon dioxide in any anæsthetic vapour should be the maximum concentration.

While carbon dioxide is considered to be harmless in low concentrations, it is not entirely free of certain dangers if concentrated. When given an overdose, there is a tendency for the patient to cough. There may be even holding of the breath and ultimately collapse. Writing in *The Journal* over a year ago, Waters[3] pointed out the possibility of carbon dioxide disturbing the acid-base balance; this might explain some of the symptoms of over-dosage. However, it is far less dangerous than chloroform, ether, or other anæsthetic vapours and, if handled with reasonable care, should save many lives and prove a valuable aid to the anæsthetist, surgeon and obstetrician.

REFERENCES

1. HENDERSON, HAGGARD, AND COBOURN, *J. Am. M. Ass.* **74**: 783, March 20, 1920.
2. MACCURDY, J. R., *Modern Hospital*, 1912.
3. WATERS, R. M., *Canad. M. Ass. J.* **17**: 1510, Dec. 1927.

RAYON AND IRRADIATION

Originally man made his textiles from such animal and plant fibres as he found; then he began growing cotton and flax, silkworms and sheep; soon he will make his fabrics chemically. The astonishingly rapid growth of the rayon industry indicates that the world is already far along toward synthetic clothing. In a recent account* it is shown that, whereas ten year ago 9,000,000 pounds of rayon was made in this country, the production for 1928 was almost 97,000,000 pounds. The raw material is wood pulp which, after treatment to loosen the fibres and to remove the lignin, is finally obtained as a solution of cellulose nitrate, acetate or the cuprammonium compound and forced through tiny apertures to form threads. The fabric made from this thread has been found well adapted to use in many garments and has already become well established in the textile trade. Rayon is similar to silk in appearance and is cool and nonabsorbent. Spun rayon has been used with cotton and wool and even to replace the latter in many fabrics. A small change in the process results in a kinky fibre similar to wool and at times difficult to distinguish from it. A hollow filament rayon has been produced, the contained gas of which increases the resemblance to silk, while filaments of great strength and elasticity are about to be introduced as rayon sewing thread. Rayon can be dyed satisfactorily, and the possibility of improvement from further research indicates that the industry has the prospect of indefinite life. Of unique physiological interest is the observation of Dozier and Morgan† that ultraviolet rays penetrate rayon better than certain widely used cotton and silk fabrics studied. This effect depends not only on the interspaces of the cloth but also on the quality of the fibre itself. On the other hand, measurements by Coblentz of the Bureau of Standards indicate that the mesh and thickness of the material are primarily concerned in transmission of ultraviolet rays. The certain method of dosage is the application of the rays directly to the skin. —*J. Am. M. Ass.* **92**: 2175, June 29, 1929.

* Ginsberg, I., *J. Indust. & Engin. Chem.*, news ed., May 10, 1929, p. 6.

† Dozier, C. C., and Morgan H., *Am. J. Physiol.* **84**: 603, April, 1928; **86**: 32, 1928.

MEDICINE IN SOVIET RUSSIA

Dr. Ralph A. Reynolds, retired president of the American Medical Association of Vienna, on his return from Soviet Russia told the *New York Herald Tribune* that he had visited a large number of clinics in Moscow and Leningrad. Under the socialist system every worker is insured, and when he gets ill the insurance not only pays the full wage during the time of disablement but also the hospital expense.

An institution which has no parallel abroad is the night sanatorium for workers who are in a poor physical condition. These workers, instead of going home when their working hours are over, pass the remainder of the day and the night in the sanatorium. They get a shower and are put to bed for an hour, then do physical culture exercises after which they may occupy themselves as they like until bedtime, which is fixed at an early hour. They are also served a special diet. Only on Sundays are they allowed to leave for their homes. Such a "cure" generally lasts two months. In Moscow there are twenty-four night sanatoria, ten of which are for tuberculosis suspects.

There are 156 day nurseries in Moscow alone, each of them near a big factory. The average attendance is 125 children. To instil the spirit of sovietism at an early age pictures of Lenin as a babe decorate the walls.

The medical service is public. Everybody is entitled to free treatment. About 140 physicians are on duty at a Moscow clinic, and from thirty to forty doctors are detailed to at-home service during the night hours. As private practice is abolished anyone taken ill or meeting with an accident during the night telephones to the nearest clinic and is taken care of.

Village clinics have been distributed so that

each clinic serves a population of 15,000. In the more sparsely populated districts this means that many people are more than fifty miles from a doctor. It is difficult to win the uncultured peasant class to modern ideas of hygiene; conditions in the open country are still appalling.

The Russian Government spends money lavishly on modern instruments and other equipment. Funds are always available for research work and propaganda, but the salaries of doctors are small and cannot compare with what a professor or a practitioner can earn in other countries. Physicians of high standing get about a hundred dollars a month and have to be contented with a miserable home of one or three rooms with a kitchen that is often shared by as many as six families. The idea is that a doctor's home should not be so good as the class of homes given to Communist skilled workers who form the aristocratic class in the Soviet Republic.

As the prospects for the medical students are totally different from what they once were, the class of people who go in for medical studies has undergone considerable change. Only those who support the Soviets enter the medical career. Women students, who, before the war, were 34 per cent are now 55 per cent of those studying medicine. Ninety-seven per cent of all medical students are educated by the government. In return they must go where the government sends them when they have completed their studies. For many this means exile in some out of the way place with great hardships. After having served three years on the post assigned to them they are free to make a choice of their own. They can shorten this three-year period if they accomplish something outstanding. Medical studies take five years in medical school and one year in hospital.

Russian doctors follow the progress of medicine in other countries closely and take over all improvements, but their own scientific research leaves much to be desired. Dr. Reynolds had the impression that the Bolshevist system is becoming firmly entrenched, and that the rulers of Russia have the country well in hand.

LILLIAN A. CHASE

IODINE AND GOITRE

The view that a deficiency of iodine in the diet is the chief factor in the etiology of simple thyroid enlargement has become well established by repeated demonstrations of prophylaxis and cures, both in experimental animals and in man. Although attention was definitely fixed on the rôle of iodine by Baumann's discovery in 1895 that this element occurs in the thyroid gland in organic combination, iodine-containing materials such as sea salt and the ashes of sponges and of sea weeds are ancient remedies for simple goitre. Through the combined efforts of various investigators both in this country and abroad, a series of apparently dissimilar diseases has been related to a deficiency of iodine in the food, which, in turn, can be correlated with the paucity of this element in the rocks and soil of the locality in question. As might be expected, then, simple goitre in man is, to a striking extent, regional in occurrence, certain places, such as the eastern sea coast, being comparatively free from the disease, while other localities, such as the Great Lakes basin, are known for the high incidence of thyroid enlargement.

The mode of action of iodine in the organism is not entirely clear. The minute quantity of this substance involved in the metabolism of the thyroid has made analytic procedures difficult to carry out. However, through the combining of known facts of goitre incidence with such metabolic studies as are possible, knowledge of significance has been obtained. Investigations of this nature have been recently reported by Lunde* in Oslo. He points out that, contrary to statements that have appeared in the literature, endemic goitre can be found in certain regions in Norway, a sea-swept country where one would least expect it. Proceeding on the principle that, in a person in iodine equilibrium, the output of iodine in the urine is an index of the amount of iodine absorbed, he investigated the excretion of iodine in a considerable number of men. They were chosen from districts in which goitre was prevalent but did not themselves have enlarged thyroid glands. The concentration of iodine in the urine was found to be influenced markedly by the use of sea fish in the dietary. When the persons studied were given a controlled diet not containing fish, the analyses showed that there was an inverse proportion between the incidence of goitre in the youth of the region and the concentration of urinary iodine of nongoitrous individuals of that locality. The average iodine output in the urine was 0.040 mg. in twenty-four hours in a district showing a goitre incidence of 59.7 per cent, while in a region free from goitre the iodine excretion was 0.173 mg. Similar studies conducted in Switzerland have given parallel results.

Since the relative concentration of iodine in the urine is an index of the level of body metabolism of this element, the correlations cited serve to emphasize again the essential dependence of the thyroid gland on iodine for its normal activity. A prolonged deficiency of this substance may from experience be expected to result in a hyperplasia of the gland. The minute traces in the food and water, as well as the small concentrations in the urine, indicate that the absolute requirement of the body for iodine is exceedingly small. Indeed, from this fact has developed the now well founded dictum of the importance of little things in the diet, one of the fundamental tenets of the modern position on nutrition.—*J. Am. M. Ass.* **92**: June 29, 1929.

* G. Lunde, *Biochem Ztschr.* **193**: 94, 1928.

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THE PUBLIC AND MEDICAL CONVENTIONS

An "experience meeting" of medical men ought to be of first class value to the public. The laymen may not understand everything or even much of what is said. But the medical men do, and they translate what they learn from the experiments and the experiences of others into practical helpfulness in the sick-rooms of their patients.

It is too often said that physicians know little or nothing about this or that ailment. The best physicians are the first to admit the serious limitations of their knowledge. But they do know infinitely more than the sufferer or his family, even if it be only a thorough knowledge of the physical frame which has been thrown out of joint.

Physicians should be regarded—not as all-wise augurs or mystic miracle-workers who can banish disease by invoking an incantation or a drug—but as soldiers fighting for health, fighting hand-to-hand battles in the humble home or about the hospital cot for the lives of the stricken. To say of a doctor that he is a real force on the side of life in his community is to say the most that can be said of him, and is to say a very great thing.

Probably no professional men work harder or longer to acquire new knowledge than physicians. They are always at school. They are always exchanging discoveries, if not at conventions then through professional journals. The happy "hit" of one doctor becomes at once public property available to the hand of every colleague. They do not patent their inventions and mint the sufferings of mankind into cash. They are sentinels always on the watch and always eager to sound the alarm when a foe approaches or when an enemy can be beaten back.

Thus a medical convention is of greater interest to the community at large than a gathering of any other class of worker. They do not meet to create monopolies but to assemble free gifts for the world at large. A cancer discovery in Vienna —if it be true—increases the expectation of life in Saskatchewan, in the Malay States, in every land under the sun. The reports of these conventions in the popular Press, couched in language understanded of the plain people, are of real and widespread educational value. To popularize medical knowledge is a public service. Nothing interests the average man so much as his health, and to be able to read what the best doctors in the world are saying about the particular malady that menaces him is a priceless boon. Yet these reports could not be printed if the medical men did not meet in open conference and discuss their difficulties as well as their achievements within the hearing of humanity as a whole.—Editorial: *Montreal Star.*

SENATOR SMOOT HITS CIGARETTE CAMPAIGNS

Taking exception to advertising campaigns to promote the use of cigarettes, Senator Smoot, of Utah, offered in the Senate to-day a resolution to include tobacco and tobacco products within the scope of the food and drugs act.

His resolution also would amend the food and drugs act so that claims made for food and drug products in any advertising medium subject to Interstate Commerce Commission control should be under the same regulation as is applied to labels on containers. Senator Smoot, whose State produces large quantities of sugar, denounced the effort of cigarette manufacturers to divert users of sweets to cigarettes.

"Not since the days when public opinion rose in its might and smote the dangerous drug traffic," said Mr. Smoot, "not since the days when the vendor of harmful nostrums was swept from our streets, has this country witnessed such an orgy of buncombe, quackery and downright falsehood and fraud as now marks the current campaign promoted by certain cigarette manufacturers to create a vast woman and child market for the use of their product."

Mr. Smoot said he was not questioning the use of tobacco by adults.

"I rise," he said, "to denounce the insidious cigarette campaigns now being promoted by those tobacco interests whose only god is profit, whose only bible is the balance sheet, whose only principle is greed.

"I denounce the unconscionable, heartless and destructive attempts to exploit the women and youth of our country in the interests of a few powerful tobacco organizations whose rapacity knows no bounds.

"Whatever may be said of tobacco as a moderate indulgence, it is clear that the issue raised before the country in some of the current cigarette campaigns is the issue raised by urging excessive cigarette smoking, by flaunting appeals to the youth of our country, by misrepresenting established medical and health findings in order to encourage cigarette addiction."—*New York Times*, June 11, 1929.

DEATH AFTER AVERTIN ANÆSTHESIA

Drs. MacWilliam and Wilson, of the Walton Infirmary, Liverpool, England, in the *British Medical Journal* (**2**: 1141, June 22, 1929), report the following interesting case:—

"The patient, a young and apparently healthy adult, was admitted to hospital on June 10th suffering from a right inguinal hernia. No sign of disease could be detected in the heart, lungs, or kidneys. He had the customary preparation—that is, a laxative on the evening of the operation and simple rectal washouts the following morning. At 5.30 p.m. his blood pressure was 125 mm. Hg, and morphine hydrochloride gr. ¼ was given.

The dose of avertin given was 5 c.cm. in a 3 per cent solution, which was rather less than 0.1 gram per kg.; this was given at 6 p.m. It had been intended to supplement this with intrathecal novocain or gas and oxygen.

At 6.30 p.m. the operation was commenced. It was found that the anæsthesia was deeper than we desired for combination with spinal novocain, but not sufficiently deep for the operation to be carried out. The patient was somewhat cyanosed, but after the administration of a little gas and oxygen the colour rapidly became satisfactory. The operation was concluded at 7 p.m., and no anxiety was felt with regard to the patient's condition. During the operation his blood pressure was again taken and found to be 118 mm. Hg.

At 9.30 p.m. the patient was a little cyanosed, but respirations were regular in frequency and depth, and the volume of the pulse was excellent. Consciousness had not been regained. At 12 midnight cyanosis was more marked, and the pulse commenced to fail. Artificial respiration was resorted to, strychnine was given, and, finally, intracardiac adrenaline. In spite of all efforts the patient died.

A post-mortem examination was made by Dr. Stuart McAusland, lecturer in anæsthetics, David Lewis Northern Hospital, Liverpool. He reported the presence of a thymus gland weighing slightly more than ½ ounce, slight congestion of the lungs and brain, normal appearance of the rectum and other organs.

The conclusion which we draw from this case is that this man failed to eliminate the drug. The method of fractional administration as approved by Mr. Morrin would not have aided us, as our patient actually had less avertin than he advises for the initial dose. We must add that the drug has given very satisfactory results in all the cases in which it has been used previously in this hospital."

Medico-Legal

[In view of the great importance of the Medical Act of Alberta and its practical application, we feel that the publication of the following letter and legal judgment will interest the medical profession far beyond the confines of the province concerned.—ED.]

Calgary, July 15th, 1929.

Dr. T. C. Routley,
Toronto, Ont.

Dear Doctor:—

We are sending you herewith a copy of a decision of the Court of Appeal of Alberta, in the matter of an investigation into the charge of unbecoming and improper conduct on the part of a physician in this province.

In 1928 we had our medical act amended so that all technicalities, over which lawyers fight and prolong litigation, were eliminated. (A copy of this amended Act was sent you.) The principal new features were as follows:—

Sec. 45, Sub. D.

"The Discipline Committee shall investigate the facts regarding any medical practitioner, whose conduct in the opinion of the Committee ought to be investigated."

You will note that it is necessary only for the Committee to consider it necessary; they do not have to wait a formal charge.

Sec. 56, Sub. 2.

"Evidence may be adduced before the Council or Discipline Committee, either by affidavit or viva voce, or both, as the Council or Committee may determine, but no medical practitioner's name shall be erased from the register on affidavit evidence alone."

Sec. 57, Sub. 5.

"The Council or Committee shall not be bound by the rules of evidence obtaining in actions and proceedings in the courts of justice, but, on the contrary, may proceed to ascertain the facts in such manner as it shall deem proper."

Sec. 47a.

"Unbecoming and improper conduct, professional or otherwise, within the meaning of this Act, shall be a question of fact for the sole and final determination of the Council or Discipline Committee, and any matter, conduct, or such thing, as in the judgment of the Council or Discipline Committee is such as to be inimical to the best interests of the public, or the profession, shall be a conduct unbecoming a member of the medical profession."

Sec. 47, Last line . . .

"Provided that there shall be no appeal from an order unanimously made by the Council."

In the case in question, the Discipline Committee recommended six months' suspension for unbecoming and improper conduct. In this the Council concurred. An appeal was taken by the doctor to the Supreme Court of Alberta. Mr. Justice Ives, sitting, dismissed the appeal, stating that, as he had held in another case, the council or committee were the sole judges as to what constituted unbecoming and improper conduct, and they had found defendant guilty; further the decision was unanimous, and therefore not subject to appeal.

A request was made to him the next day to permit an appeal from his decision, which he granted, and the judgment we are enclosing is the decision of the Court of Appeal of Alberta, which court held with the council, stated that the evidence as submitted to the Discipline Committee was not subject to review by the Supreme Court or the Court of Appeal, that the Com-

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mittee had the right to decide what was unbecoming, and, further, the council being unanimous, the matter was settled.

As this will be of value to the profession at large, we would suggest that perhaps you might put the matter in the Canadian Medical Association Journal, leaving out the name of the individual doctor.

Yours truly,
(Signed) W. G. HUNT,
Assistant to Registrar.

IN THE SUPREME COURT OF ALBERTA

Appellate Division

. . . . . .

Re COLLEGE OF PHYSICIANS AND SURGEONS

and

. . . . . .

JUDGMENT

Of the Honourable, the Chief Justice

This is an appeal from the decision of Ives, J., refusing to quash an order made by the Council of the respondents suspending the appellant from practice for six months.

There is no appeal from such an order when the Council is unanimous, as was the case here. In consequence proceedings were taken by way of certiorari.

Mr. McGillivray has gone into the evidence and strongly urges that there is no sufficient evidence to justify the order made by the Council and that a great injustice has been done the Appellant.

The question we have to consider is whether even if that be the case we have the authority to right it, for we must decide the appeal on legal and not sympathetic grounds.

It is necessary, therefore, to consider with some care what are the powers of the Court upon certiorari for Mr. McGillivray strenuously maintains that we may look at the evidence for the purpose of reaching our conclusion, and he argues that the decision in R. *vs.* Nat Bell, 1922, 2 A. C. 128 which held that that could not be done is binding only in respect to summary convictions.

In R. *vs.* Pudwell (1916) 26 C.C.C. 47 my brother Hyndman held that the evidence could not be looked at for the purpose of an application to quash on certiorari.

In the same year, in R. *vs.* Carter 9 A.L.R. 481, 26 C.C.C. 51, I went somewhat at length into the authorities and came to the same conclusion. A few years later this division, composed of four judges, unanimously came to the opposite conclusion in R. *vs.* Emery (1916) 10 A.L.R. 139, thereby displacing the authority of the two previous decisions. Our Courts acted on this view until the Nat Bell decision by the Privy Council above mentioned, which in terms displaced the authority of R. *vs.* Emery and held that the view of the earlier decisions was the correct one. The Pudwell and Emery cases were both cases of indictable offences tried summarily by a Magistrate, while the Carter case was one of a summary conviction, but no distinction was made in the reasons in this regard, but in the judgment in the Nat Bell case it is pointed out that while it was a case of summary conviction the Emery case was one of an indictable offence, and the judgment declares that "Their Lordships wish to keep open this distinction if it be one," and then proceeds to consider the principle in its general application.

Subsequently this division held in R. *vs.* Oakes (1923) 19 A. L. R. 501 that the Nat Bell decision did not apply in the case of an indictable offence and looked at the evidence and this was later confirmed in R. *vs.* Kramer (1924) 20 A.L.R. 244.

It is contended that the effect of these last two decisions is to limit the application of the Nat Bell decision to summary convictions, but, as Beck, J. was so careful to point out in R. *vs.* Oakes, decision is only authority for what it decides; therefore, these decisions must be considered as only authority for the right to look at the evidence in case of indicable offences and in so far as principle or reasoning is concerned the decision of the Privy Council is, of course, one of the highest authority for us.

It was held in R. *vs.* Nat Bell that the law had been properly laid down in Reg. *vs.* Bolton 1 Q. B. 66, and had been applied to the Dominions by Colonial Bank of Australasia *vs.* Willan, L.R. 5 P.C. 417. Willan's case was not a criminal case, and it was argued that there was a difference between Civil and Criminal cases, but Lord Sumner delivered the judgment of the Committee at p. 154 when he says "The whole theory of certiorari shows that no such difference exists. The object is to examine the proceedings in the inferior Court to see whether its order has been made within its jurisdiction. If that is the whole object there can be no difference between civil orders and criminal convictions, except in so far as differences in the form of the record of the inferior Court's determination or in the Statute law relating to the matter may give an opportunity for detecting error on the record in one case which in another would not have been apparent to the Superior Court, and, therefore, would not have been available as a reason for quashing the proceedings."

Again, at p. 156, he says "That the Superior Court should be bound by the record is inherent in the nature of the case. Its jurisdiction is to see that the inferior Court has not exceeded its own, and for that very reason it is bound not to interfere in what has been done within that jurisdiction, for in so doing it would itself, in turn, transgress the limits within which its own jurisdiction of supervision, not of review, is confined. That supervision goes to two points: one is the area of the inferior jurisdiction and the qualifications and conditions of its exercise; the other is the observance of the law in the course of its

exercise." And again, at p. 161, "There is not one law of certiorari before 1848 and another after it, nor one law of certiorari for England and another for Canada" and he concluded his reasoning on this branch at p. 165 where he says:

> "Their Lordships are of the opinion that the provisions of the Canadian Criminal Code and of the Alberta Liquor Act have not the effect of undoing the consequences of the enactment of a general form of conviction; that the evidence, thus forming no part of the record, is not available material on which the Superior Court can enter on an examination of the proceedings before for the purpose of quashing the conviction, the jurisdiction of the magistrate having been once established, and that it is not competent to the Superior Court, under the guise of examining whether such jurisdiction was established, to consider whether or not some evidence was forthcoming before the magistrate of every fact which had to be sworn to in order to render a conviction a right exercise of his jurisdiction."

It seems clear from this that where there is no statutory provision making the evidence part of the record it cannot be looked at for the purpose of quashing the conviction or order, because it does not really affect the question of jurisdiction. There is nothing in the Act under which the Council purported to act that could have the least application to the matters now under consideration which must, therefore, be dealt with under the general principles declared in that case to be applicable.

The only ground, therefore, which is open to the appellant is error on the face of the record.

It is contended that the appellant is charged with one thing and found guilty of something quite different. The fact is that he is charged with unprofessional conduct and it is of that that he is found guilty. It is true that what the unprofessional conduct consisted of is not expressed in exactly the same terms in the charge as in the findings of guilt but I cannot see that even in respect to that there is any difference of substance.

Then it is urged that the order directs the registrar to suspend the appellant, whereas the statute only authorizes the Council to suspend him.

The Medical Profession Act C 209 R.S.A. 1922 provides (Sec. 45) that charges of this sort shall be investigated by the Discipline Committee which shall report to the Council "And if the Committee finds that the medical practitioner has been guilty of an offence which warrants it, and so reports to the Council, the Council may direct the Registrar to erase the name of such registered practitioner from the register, or the Council may, in its discretion, suspend such person from the privilege of a registered practitioner for such time not exceeding three years at it sees fit, etc.

The Committee recommended:—

> "That Dr. . . . . be suspended from the practice of medicine in the Province of Alberta for a period of six months," and the Council resolved that that recommendation "be and is hereby approved of and the Registrar is hereby authorized and instructed to suspend the said Dr. . . . . from the practice of medicine in the Province of Alberta for a period of six months, commencing June 1st, 1929."

As was pointed out in the argument all orders-in-Council are made in just that way by the recommendation to the Sovereign or his representatives and his marking it "approved."

The approval by the Council of the Committee's recommendation was the Council's order for a six months' suspension, and the direction to the Registrar is for his guidance and communication to the Appellant that that six months was to run from June 1st, 1929.

Then it was argued that by the terms of Section 46 the Committee could only recommend such suspension when coupled with its own suspension till the Council's next meeting. Whether there might be force in this argument if Section 46 stood alone need not be considered, for the provisions of Section 45 already quoted are sufficient statutory authority for what was in fact done.

Then it is said that the appellant is not shown to have been a medical practitioner and so subject to the Council's jurisdiction. That would appear to be really a question of evidence not open for consideration but if it were I am of opinion that though there is no direct evidence of the fact there is plenty of evidence from which the inference could be properly and certainly drawn.

On none of the grounds mentioned or on any other am I able to see any valid reason for questioning the legal sufficiency of the Council's order and I would, therefore, dismiss the appeal with costs.

(Signed) HORACE HARVEY,
C. J.

Calgary, Alta. 26th June A.D., 1929.

C. F. Adams, Esq., K.C., for the Respondent, College of Physicians and Surgeons. A. A. McGillivray, Esq., K.C., and F. C. Moyer, Esq., appeared for the Appellant.

XUM

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

On the 28th of May, the citizens of Edinburgh celebrated the six hundredth anniversary of the granting of a Charter to the Burgh and to the Port of Leith by King Robert the Bruce in 1329. This Charter is important chiefly because it is the earliest Royal Charter to the City of Edinburgh extant. Previous Kings of Scotland had granted charters to the city prior to 1329, but these, owing to the perpetual bickerings of the day and the vicissitudes of war with the "auld enemy" England, had been lost, stolen or destroyed. This six hundredth anniversary is not that of the foundation of the city, nor its creation as a Royal Burgh. Edinburgh is, in fact, one of the oldest Scottish Burghs, and from the earliest times held its territory and privileges direct from the sovereign. Part of the official program to commemorate the event was the unveiling of memorials to Sir William Wallace and to King Robert the Bruce, on the Castle Esplanade, by his Royal Highness the Duke of York, who was accompanied by the Duchess. Representatives from various public bodies, including the University and the Royal Colleges of Physicians and Surgeons, attended this ceremony which was preceded by a religious service in St. Giles Cathedral and followed by a civic luncheon in the Assembly Rooms.

During their stay at the palace of Holyroodhouse the Duke and Duchess of York paid visits to various medical and nursing institutions in the city. In addition to performing the ceremony of laying the foundation of the Gogarburn Institution for Mental Defectives, their Royal Highnesses spent some time at the Edinburgh Royal Infirmary. They first went to the surgical ward of Mr. J. W. Struthers, and subsequently visited the medical side of the hospital, where they were received by Professor Edwin Bramwell and Dr. Fergus Hewat. A surprise visit was also paid to the massage department in the new radiological building. The Duchess of York visited the headquarters of the Scottish Branch of the Queen's Institute for District Nursing, of which she is the President. During the forty years of its existence this Institute has trained and found appointments for 722 nurses in various parts of Scotland. The nurses come to the Institute fully trained from various hospitals, and are employed nursing the sick poor in Edinburgh, with a superintendent to teach them. After this additional specialized training they are sent out to districts that apply for a Queen's nurse. They are to be found in all parts of Scotland, in the remote highlands and islands, as well as the lowland agricultural and industrial districts. Wherever they go their work is characterized by the highest skill and industry. In addition, their training in the homes of the poor has taught them independence, self-reliance, and the art of improvising and making the best use of such materials as come first to their hands. At present there are 87 nurses training in the Institute. The Duchess of York also paid a visit to the Edinburgh Royal Maternity and Simpson Memorial Hospital. The Duchess was taken round several of the wards by Professor Johnstone and Dr. Hugh S. Davidson.

Amid the many honours that have been conferred on the retiring Principal of the University none is more notable than the award of the Albert Medal of the Royal Society of Arts for his work on magnetism and his services to technical education. Since its institution this prize has only been awarded to sixty-nine persons. There are two Albert Medals. These were founded in memory of the Prince Consort. One is bestowed by the Sovereign for life-saving. The other is granted annually by the Royal Society of Arts for merit in promoting arts, manufactures and commerce. A glance at the list of the former recipients shows that Sir Alfred Ewing has joined a distinguished company of famous men and women who have already been accorded this honour. Sir Rowland Hill, who introduced the penny post, was the first recipient. Among others who have received the medal are Michael Faraday, Ferdinand de Lesseps, of Suez Canal fame, Sir Henry Bessemer, Lord Armstrong, Lord Kelvin, and Louis Pasteur. In more recent years we find such well-known names as Madame Curie, Senator Marconi, Sir David Bruce, Sir Ronald Ross, and Sir Aston Webb.

At the fiftieth annual meeting of the Edinburgh University Club of Manchester, the guests of the Club were the Right Honourable Sir Auckland Geddes, G.C.M.G., and Sir David Wallace, K.B.E., Dr. A. Corsar Sturrock occupied the chair, and members and guests to the number of one hundred and twenty dined together. A most enjoyable evening was spent, due in large measure to the contribution made by the former British Ambassador to the United States.

In addition to that in Manchester, Edinburgh University Clubs exist in a flourishing condition at Aberdeen, Birmingham, Sheffield, London, the North of England, the West Riding of Yorkshire, and Cape Town.

At the Graduation Ceremonial on the 27th of June the Senatus Academicus awarded the honorary degree of Doctor of Laws to Abbott Lawrence Lowell, Ph.D., LL.D., Litt.D., President of Harvard University.

Lieut.-Col. A. G. McKenrick, I.M.S., (ret.) Superintendent of the Royal College of Physicians' Laboratory has been invited to analyze and report on the statistics of the antirabic institutes of all countries, for the Health Department of the League of Nations.

Dr. J. S. Fraser, F.R.C.S., Edinburgh, has been

awarded the Freeland Barbour Fellowship of the Royal College of Physicians for his work on the Pathology of the Ear, carried out in the Research Laboratory of the Royal College of Physicians.

The old Craigleith Poorhouse on the northern side of the city has been reconditioned and opened by the Edinburgh Parish Council as a hospital. The opening ceremony was performed by Dr. J. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland. This institution was originally opened in 1868. During the war it was taken over by the government as a military hospital—the Second Scottish General Hospital. After the war the building was used by the Pensions Ministry as a hospital, and was finally handed back to the Parish Council some two years ago. Under the Local Government (Scotland) Act, 1929, which is to sweep away all Parish Councils, this Institution will be handed over to the town council and become a municipal hospital.

GEORGE GIBSON.

23 Cluny Terrace, Edinburgh.

The London Letter

(From our own correspondent)

The ninety-seventh annual meeting of the British Medical Association has just come to a successful conclusion. Most of the important papers read at the scientific sections and a full account of the business discussions will be reproduced during the next few weeks in the *British Medical Journal* and here only an impression of the meeting as a whole will be attempted. This in itself is almost superfluous this year for the presence of Professor Harvey Smith, of Winnipeg, the President nominated for 1930, was a sufficient guarantee that Canada would be told all about the proceedings at Manchester. Of the business meetings it can be said that while the discussions reached their usual high level there was less disagreement among the representatives and in consequence decisions were reached more easily and the work of the Council for the forthcoming year ought to be straightforward under the guidance it has received. The position of the voluntary hospitals and the future policy of the Association with regard to such matters as pay-beds in the voluntary hospital, remuneration of the honorary staffs, etc., have been discussed from time to time in these notes, and at Manchester the meeting was concerned not so much with theoretical details of the difficulties of the future but rather with the best methods of carrying out an agreed policy. The development of the Public Health Service, especially in view of the new Local Government Act, was considered particularly as concerns the salaries of officials in this service and the scheme put forward was accepted with surprisingly little dissent. The report on psycho-analysis was made much of in the lay press and a close reading of this will well repay the time spent, for it represents a very careful survey of the situation and is a good example of the Association's very fair method of dealing with such problems.

In 1921 a committee, presided over by the Earl of Athlone, came to the conclusion that the facilities for teaching public health work in London were very scattered and they recommended a new post-graduate institution to meet this position under the name of the Institute of State Medicine. Last month H.R.H. the Prince of Wales opened the new London School of Hygiene and Tropical Medicine which represents a carrying out of the Athlone Committee's recommendations. The old school of tropical medicine founded by the Seaman's Hospital Society has, by its own will, become merged with the new school of hygiene and the building was made possible by a magnificent grant from the Rockefeller Foundation of £460,000. The running expenses of the building thus provided are to be met partly by a grant from the British Government and its international nature was rightly emphasized by various speakers at the evening ceremony. Situated in Gower Street close to University College and the British Museum, almost adjoining the new site for London University and very near to the Endsleigh Gardens Hospital for Tropical Diseases, the new building is magnificently central and is a noteworthy addition to academic architecture. The director of the school will be Dr. Andrew Balfour, and he has associated with him a strong staff of well-known leaders in preventive medicine. As the Prince of Wales said, "there are no territorial frontiers in hygiene," and at the new school it is hoped to train men and women of all nationalities desirous of entering the public health services of this country and abroad.

The discussions on damp and its relation to the rheumatic group of diseases threaten to drag on almost interminably, although at long last the majority of physicians seem to be agreeing that they have a definite connection at any rate as far as children are concerned. This fact may go a long way to explain the frequency of acute rheumatic fever and its cardiac complications in these islands with the customary humid climate, but it might be thought that so long as our houses were dry the weather outside did not matter so much. As a matter of fact, it is the law of the land that a dwelling house must not be damp but this high legal ideal is only faintly realized. An interesting co-operation between the British Medical Association's Committee on Rheumatic Heart Disease in Children and the Royal Institute of British Architects has produced a report which is unpleasantly startling. It appears that a properly qualified architect is concerned with the building of only 13 per cent of residential houses, and that while by-laws and regulations ought to ensure that houses are properly constructed to avoid damp this does not work out satisfactorily in practice. In other words, the majority of our houses are damp because they are imperfectly built, and if rheumatic heart disease

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has some connection with this the first step would seem to be the enforcement of existing laws to make our houses dry. This work of the Royal Institute of British Architects in association with the profession is the first of its kind and it is hoped that further co-operation on matters of mutual interest may take place.

ALAN MONCRIEFF.

London, August, 1929.

Abstracts from Current Literature

MEDICINE

Bronchoscopic Findings in Lobar Pneumonia. A Preliminary Note. Coryllos, P. N., *Am. J. M. Sc.* **178**: 8, 1929.

That lobar pneumonia is essentially a pulmonary atelectasis produced as a result of the blocking of a bronchus by the inflammatory reaction to the pneumococcus, and that the pneumonic lung is actually smaller than its normal fellow on the opposite side, are the startling results of the clinical and experimental investigations of the author.

Experimental lobar pneumonia in the dog induced by insufflating into a bronchus a concentrated culture of the pneumococcus elicited the fact that this bronchus did not breathe. A plug of brownish viscid fluid occluded the bronchus. When this plug was removed by aspiration the lung became partially aerated. Skiagrams of the lungs showed a picture indistinguishable from pulmonary atelectasis produced as a result of ligating a bronchus. Moreover, when the chest was opened after tying the trachea so that air could not enter, it was found that the affected lung was actually in a state of partial atelectasis, being definitely smaller than the normal one.

In order to confirm these findings in the human subject with lobar pneumonia, nine cases were bronchoscoped early in the course of the disease. No untoward effects are said to result from the bronchoscopy. In all nine cases the bronchus corresponding to the consolidated area was occluded and the circulation of air shut off. In one case which died the chest was opened after the trachea had been clamped. It was found that the consolidated lung was smaller than the normal one. These findings were further supported by the appearance of the shadow in the skiagram and the slight displacement of the trachea and heart to the affected side.

The author's conclusions therefore are that the mechanism of the production of lobar pneumonia is plugging of a bronchus followed by atelectasis of the corresponding lobe. It follows that the affected lobe in pneumonia, contrary to the general opinion, is smaller than its normal fellow. The error in the current conception has resulted from the appearance of the lungs when the thorax is opened without first clamping the trachea. The opening of the thorax destroys the negative pleural pressure, the normal lung elasticity brings about contraction, and air is forced out. When the trachea is clamped this cannot occur. The author believes that many puzzling problems in connection with the physio-pathology of pneumonia are explained by his observations. Some of these are: the lobar distribution of the disease; the sudden onset preceded by slight bronchial catarrh; the diminished breath sounds at the onset; the wedge-shaped roentgenographic shadow at the very onset of the disease; the predominance of pneumonia in the lower lobes, especially the right; and the frequent displacement of the trachea to the affected side.

Further experimental studies on dogs made in conjunction with G. L. Birnbaum, and reported at the same time (*Ibid.*, p. 15-20) offer additional proof of his contentions.

E. S. MILLS

Complications and Fatality of Typhoid Fever Among Filipinos. Lantin, P. T. and Ignacio, P., *Am. J. M. Sc.* **178**: 39, 1929.

This review of typhoid fever is of considerable interest because the conclusions are based on a series of 3,255 cases accurately observed at the Filipino General Hospital, Manila, since 1910. The facts elicited may be summarized as follows: (1) Almost twice as many males as females were affected. (2) Three-quarters of all cases occurred between the age limits of 11 and 30 years. (3) No decrease in the incidence of the disease over the 17 year period was noted. (4) Intestinal hæmorrhage occurred in 338 cases, or 10.3 per cent of the series. (5) Perforation took place in only 38 cases, or 1.16 per cent. (6) Lobar and bronchopneumonia complicated the disease in 145 and 133 cases, or in 4.4 per cent and 4.0 per cent. (7) Other complications included severe toxæmia in 322 cases (9.9 per cent; acute myocarditis in 320 cases (6.7 per cent); acute nephritis in 39 cases (1.2 per cent); acute cholecystitis in 34 cases (1.0 per cent); and parotitis in 15 cases (0.46 per cent).

The mortality was 19.2 per cent, almost identical with the figure given by Jaccoud for 64,600 cases (19.64 per cent). It is of interest that death occurred in 97 per cent of perforations, 40 per cent of hæmorrhages, 50 per cent

of pneumonias, and in about 60 per cent of the cases showing severe toxæmia. When the authors compared their statistics with those from other reliable sources it was found that the incidence of intestinal perforation was low, and that of hæmorrhage and pneumonia relatively high.

E. S. MILLS

A Case of Diabetes Mellitus Showing Aglycæmia Without Symptoms. Peters, C. A., and Rabinowitch, I. M., *Am. J. M. Sc.* **178**: 29, 1929.

The authors report a case of moderately severe diabetes with hyperglycæmia, who exhibited no symptoms of insulin shock when overdoses of this drug were given. Examination of the blood at hourly intervals during a fasting period of 9 hours after 10 units of insulin showed that the fermentable sugars in the blood (glucose) had practically disappeared. Two hours after the insulin was given the blood glucose was 0.001 per cent, and six hours later it was still 0.005 per cent. During this period of time the subject of the experiment presented none of the signs or symptoms usually associated with inordinate lowering of the blood sugar.

The authors suggest that hypoglycæmia is not the only cause of the train of symptoms which as a rule result from an overdose of insulin.

E. S. MILLS

A Note on Narcolepsy. Kennedy, A. M., *Brit. M. J.* **1**: 1112, June 22, 1929.

The recurrence of paroxysmal attacks of sleep of an irresistible nature has received considerable attention. Kinnier Wilson summarized the current knowledge of the various forms of narcolepsy last year and collected records of 43 cases. Some of these prove to have pathological lesions, such as cerebral arteriosclerosis, cysts, encephalitis lethargica, etc., but in others no definite cause can be assigned and at present must be given the title "idiopathic."

Included in this class is the type of case reported by Dr. Kennedy. The patient was a chauffeur of 26, in whom the symptoms of narcolepsy had been present for thirteen months before visiting the doctor. There was nothing special in his history except mild symptoms of some vasomotor disturbance. At the age of 22 he began to have transient attacks of double vision, which came on about once a month, lasting for five or ten minutes. These gradually became more frequent. Three years later, sensations of fullness and throbbing appeared, and for the first time attacks of drowsiness. These last would come on quite suddenly, with no warning "aura". After some months he was forced to give up driving a car, as the attacks of drowsiness nearly caused him several accidents.

He came to hospital for observation and was there for seven weeks, during which time it was noted that he showed spasmodic movements of the limbs, head, or body on very slight stimulation. These, with occasional flushings of the face and restless nights, were the most notable signs he presented. Physically, no abnormality could be made out. X-ray and all other laboratory examinations were negative. Two months after leaving hospital he had his first definite cataleptic attack, which came on while crossing the street. He had recurrences of this throughout the next two months, but gradually it wore off.

It is now twenty months since the onset of his symptoms, and he has shown none of the ordinary signs of intracranial tumour. His condition seems to be improving generally.

H. E. MACDERMOT

Poisoning from Commercial Methyl Chloride. *Chicago's Health* **23**: 90, July 15, 1929.

Modern progress is not without its disadvantages, and the advent of the electric refrigerator has added a new danger to the already harassed householder. Recent newspaper reports from Chicago described fatalities presumably from methyl chloride used in the process of electric refrigeration. The latest bulletin of the Chicago School of Sanitation Instruction gives an account of this. During the past year there have been reported in Chicago 25 cases of poisoning by commercial methyl chloride gas, with 7 deaths. Practically all the cases developed in so-called kitchenette apartments equipped with electric refrigerators which were leaking. The characteristic symptoms were drowsiness, mental confusion, weakness, nausea and vomiting. The pulse and temperature was usually increased, and 2 of the fatal cases had temperatures of 107.° In nearly all these cases there was prolonged anuria (some as long as 48 hours). According to Baker, who reported in 1927 twenty-one cases among workmen engaged in the manufacture of these refrigerators, formates are usually found in the urine. In the only 2 cases examined for this in Chicago formates were found.

There is evidently a real hazard here which the medical profession should be aware of. The Health Commission of Chicago has drafted an ordinance regarding the construction and installation of electric refrigerators. Such measures might be considered by the Canadian health authorities.

FRANK G. PEDLEY

XUM

Public Instruction in Medicine. Robey, W. H. The Shattuck Lecture, (Read before the Annual Meeting of the Massachusetts Medical Society, June, 11, 1929).

Why should not the public want to learn about medicine and disease? People are better educated than ever before; their minds are more receptive and perceptive. Yet, when you discuss medicine with your most intelligent patients you will find a mass of superstitious survivals and distorted theories.

The physician of to-day is still bound by tradition. There is still a tacit acceptance in general that any form of publicity emanating from or referring to a physician, even for the public weal, is a breach of professional ethics, in that attention is called to that particular physician. Yet, a sufficient number of physicians, whose integrity is beyond question, have sought in a variety of ways to reach the public ear with instruction in the incipient signs of the disease which they have become eminently qualified to discuss.

Most physicians are individualists. A general practitioner may be too much occupied with the ever changing scenes of his daily routine to spend the time upon the accumulation of data and the publication of the facts deduced. At the end of a taxing day of travelling, diagnosing, and advising, he may be too weary to do more than jot down the salient points of his cases, but here exists one of the greatest opportunities for important community service. Every city has its clubs who are showing an increasing desire to put medical papers on their programs. Every physician who is invited to appear before any group is urged to realize that he has at least one talent not to be securely wrapped in a napkin but which it is his privilege to invest in public welfare, in order that it may yield a return in more intelligent understanding regarding disease which our profession is eager to place at the disposal of all who wish to learn.

Public lecture courses are given at Harvard, Boston University, and at Johns Hopkins. The essentials of the lecture are given in the daily press and create more or less discussion among the various groups.

There is no more opportune time for establishing the right point of view in matters medical and sanitary than during the hours of hospital life. There are nurses who, without seeming effort, transform the mental attitude of the patient so that he leaves the hospital a messenger of better living to his community. The author's plea is for greater recognition of the hospital on its educational side. It would be a desirable achievement if some methodical instruction could be given to internes in the elements of their relation to patients beyond the diagnosis and treatment of disease. More and more should our young doctors appreciate their responsibilities in the community at large if they are to share in the campaign of enlightenment which is already under way, but which must be supported with constant vigilance if it is to become widespread and still more productive of satisfactory results.

Charlatans have always existed and always will, unless there is a universal scientific education and a very radical change in human nature. To many, even among the civilized, there is something mysterious about disease, and we are still faced with unreasoning opposition to scientific medicine, and with onslaughts of bitter antagonism.

Legislators do not as a rule belong to an unintelligent class, and most of them have personal physicians from whom they should learn the rights and wrongs of various forms of practice. Attendance at legislative hearings is for us both irksome and time-consuming, yet it is a duty to indicate to the public, by our presence, and, if possible, by our speech, the interest and belief which we hold in the maintenance of the laws of health and rational medicine. The indifference to community duty costs us dearer than we sometimes realize. But the people are not fools; they are mere children in medical matters, accepting the benefits in public health measures as infants do their food and raiment, and fail to realize that victories for the common welfare have been slower and more difficult in the winning than those on the fields of honour. If the laity knew more about the history of medicine, knew that when smallpox, one hundred and seventy-five years ago, passed through an unvaccinated English village two-thirds of the inhabitants were left in the churchyard, would it be so willing to allow the scourge to return?

Not long ago the *New York State Journal of Medicine* suggested that county medical societies should hold a public meeting once a year. It is an idea to be given serious and prompt consideration.

Probably the outstanding health problem of to-day is the crippling diseases of middle life, their prevalence, economic distribution, and the availability of resources for treatment and prevention. The chronically disabled are with us like the poor; we must not evade; we must aid in solving the question.

Another question which the laity may possibly decide for us in the near future, if we do not as a profession take some action, is birth control. For several years a group of earnest and intelligent men and women in Boston have been at work on the question, and if we are not careful we shall be aroused from our slumbers to find that we are playing a secondary part. If a chapter of medical history

is to be written, are we, or propagandists, to be the authors? If, after organized investigation, we reach the conclusion that such a chapter should not now be written, we shall have squarely faced our responsibility.

LILLIAN A. CHASE

SURGERY

Varicose Veins: The Injection Versus the Operative Treatment. McPheeters, H. O., *Surg., Gyn. & Obst.* **48**: 819, June 1929.

The modern injection treatment of varicose veins dates from 1911. Linser and Sicard both noticed that veins become sclerosed following treatment for syphilis. The former used 20 per cent sodium chloride for the injection of varicose veins. The latter at first used sodium carbonate, but later 20, 30 and 40 per cent sodium salicylate.

Statistics have been collected from many surgeons using different types of operations and the results compared with 53,000 injections reported by the author.

Varices of the lower extremity alone are discussed. Changes here are of low-grade inflammatory nature. A reverse flow results in the affected veins.

The average time before resuming work in surgically treated cases was 34.8 days. No time is lost in the injection treatment. Embolus occurred in 0.53 per cent of surgical cases; in 0.00754 per cent of injection cases: 0.41 per cent of cases treated surgically died. Operative care demands a hospital stay of 15.1 days; injections, none. Recurrence following injection will be impossible if sufficient of a suitable solution is injected to destroy the intima. The resulting thrombus is organized and a fibrous cord results. As the fluid also reaches the collaterals these are obliterated. Five-year recurrences following surgery were 19.2 per cent, according to twenty-two replies received. Sloughs and periphlebitis following injection are due to errors in technique.

The author considers the injection method a great step forward in the care and treatment of varicose veins.

R. V. B. SHIER

Bile Peritonitis and Bile Ascites. Ravdin, I. S., Morrison, M. E., and Smyth, C. M., Jr., *Ann. Surg.* **89**: 878, June 1929.

The authors first define bile peritonitis and bile ascites. Bile peritonitis follows the effusion of bile in the peritoneal cavity, the result of injury, the slipping of a ligature, or from extravasation; bile ascites, or bilious peritonitis, being major ascitic accumulations in the peritoneal cavity resulting from portal obstruction which are bile-stained from an existing jaundice.

The symptoms of bile peritonitis are those of an acute or subacute peritonitis; fever, an increase in the polymorphonuclear leucocytes, early and marked abdominal tenderness, and rigidity associated with varying degrees of distention. Vomiting is early and persistent. The urine first shows evidences of an irritative nephritis, and later there is anuria. Bradycardia and hypotension with a slow irregular respiration are observed early.

Several factors have been thought responsible for the toxic property of bile. Some held that the pigment and salts were responsible, while others suggested impurities in the bile. However, the consensus of opinion at the present time is that the bile salts are the toxic agent.

Sodium taurocholate in concentrations over 0.009 grams, when injected intraperitoneally into mice, causes death, but no such action was demonstrated when the sodium taurocholate was saturated with cholesterol. This led Flexner to suggest that the diminished toxicity was due to the action of protective colloids.

Various ways are discussed as to the method in which bile may enter the peritoneal cavity.

The conclusion is that the occurrence of authentic bile extravasation, or bile peritonitis without perforation, has not yet been proved.

We may conclude, therefore, that in those cases in which bile peritonitis occurs there must have been at one time or other an opening having a direct connection with the biliary passages, and also that it is not necessary for bile to be infected to cause bile peritonitis. Bilious peritonitis would appear to be the result of an ascites occurring when the patient has a general icterus, rather than a filtration of the bile through the extrahepatic ductal walls.

R. V. B. SHIER

GYNÆCOLOGY

Zur klinischen Frühdiagnose des Portiokarzinoms. (The early clinical diagnosis of carcinoma of the portio.) Schüler, W., *Zentralbl. f. Gynäkol.*, **52**: 1886, 1928.

This paper gives an account of a simple manoeuvre which, apparently, is of great value in connection with the early diagnosis of cancer of the cervix uteri. The rationale depends on the fact that the glycogen content of the cells of cancerous tissue is less than that of normal cells. If the suspected area is painted with a solution of potassium iodide, or with Lugol's solution, the normal epithelium takes on a deep brown colour, while diseased epithelium either remains unstained or becomes yellow. Some doubt might exist in the case of simple inflammation or hyperkeratosis of the part, but here there is a gradual transition in colour from the normal to the abnormal part, while in the case of cancer the demarcation is abrupt.

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The value of this test lies in this, that at the time of operating the surgeon can distinguish between normal and cancerous tissue, and can plan his operation accordingly; also, when a part has to be removed for microscopic examination the surgeon can be sure that he has removed a suitable portion; the pathologist can also check the surgeon's work by examining the removed tissue and determining whether or not a portion of the new growth has been left behind. The test is equally applicable to tissue that has been removed. If the colour has faded it can be renewed in the laboratory by again painting the tissue with the solution.

A. G. NICHOLLS

PÆDIATRICS

A Statistical Study of the Rate of Skeletal Growth in Juvenile Diabetes. Rabinowitch, I. M., and Bazin, E. V., *Arch. Dis. Child.* **4**: 21, June 1929.

In a study of diabetic children at the Montreal General Hospital, the authors confirm an observation made at Joslin's clinic in 1927, that children with diabetes tend to be overheight. Of the seventy-one children investigated, forty were overheight for their age on admission to the clinic. In addition, they observe that after the institution of treatment the average rate of growth of these diabetic children was less than normal. This they relate to the further observation that in all children admitted to the general clinic, the rate of growth was least in those who were overheight.

Seventy-one overheight normal children grew while under observation at a rate that was 112 per cent of the normal, while the seventy-one diabetics showed a rate of growth that was only 75 per cent of the estimated normal. Statistical proof is given that the finding is not a chance occurrence.

It would thus appear that a common stimulus causes diabetes and excess skeletal growth in the child. The authors suggest that the anterior lobe of the pituitary body by means of its associations with the sympathetic nervous system may be the factor responsible for diabetes in overheight children. The necessity of further studies is pointed out.

A. K. GEDDES

Infections as a Source of Recurrent Epileptiform Seizures in Children. Paterson, D., and Bray, G. W., *Arch. Dis. Child.* **4**: 21, June 1929.

Twelve children under the age of nine years, all of whom had had recurrent bouts of epileptiform convulsions with fever and acetonuria, were studied with the object of ascertaining the cause and significance of the convulsions.

In three-fourths of the cases the convulsions commenced during the period of first dentition. There was an average of 5.25 seizures per patient and an average interval of 4½ months between attacks. The average period of observation was two years. In over 80 per cent of the cases naso-pharyngeal infection appeared to be the cause of the convulsions, and in half the cases the diet had been excessively high in fats. During the intervals the children showed no abnormality either mental or physical.

The fever, acetonuria, ketogenic diet, and lack of mental deterioration rule out idiopathic epilepsy as the cause. Nor do these children later become epileptics. Experimental evidence that acetone may cause convulsions is reviewed, and the hypothesis advanced that the seizures in these cases may be due to acetone in the blood and spinal fluid.

The treatment is the eradication of all foci of infection and the institution of a diet liberal in carbohydrates and moderate in fats. The prognosis for recurrence depends upon prophylaxis against infections. The prognosis for mentality is good.

A. K. GEDDES

The Intelligence of Epileptic Children. Dawson, S., and Conn, J. C. M., *Arch. Dis. Child.* **4**: 21, June 1929.

From a statistical study of 49 epileptic children in Glasgow, Dawson and Conn conclude that their average intelligence is definitely subnormal, varying in individual cases from normalcy to imbecility; there is deterioration directly due to the epilepsy; they come from a stock which seems to be normal as far as intelligence is concerned; there seems to be no relation between the degree of mental deterioration and the length of time the patient has had convulsions; neither is there evidence of any relation between the frequency or severity of the seizures at the time of hospitalization and subsequent improvement in the general condition of mental progress; there is a definite correlation between improvement in general condition and mental progress.

A. K. GEDDES

PATHOLOGY

Das Glycogen des Blutes bei pathologischen Zuständen. (The glycogen of the blood in pathological conditions.) Schwarz, L. S., and Gerson, S. L., *Deutsches Archiv f. klin. Med.* **164**: 96, May 1929.

The interest in glycogen, that fundamental substance in carbohydrate metabolism, dates from 1857, when Claude Bernard discovered it in the liver. It has ever since attracted the attention of physiologist and pathologist. The authors give a useful résumé of the literature on the subject up to the date of their own investigations.

They have studied 79 patients suffering from a variety of diseases, divided as follows: liver affections, 15; diabetes, 15; malignant tumours, 17; kidney affections, 7; heart affections, 6; septic infection (gynæc.), 4; adiposity, 2; chronic sepsis, 4; croupous pneumonia; Graves' disease; polyserositis; tuberculosis; arthritis deformans; spontaneous gangrene; myeloid leukæmia; gastritis; arteriosclerosis, 1 each.

The method of demonstrating the glycogen in the blood is that devised by Joung and Planelles and is very suitable for clinical purposes.

Glycogen is frequently present in the formed elements of the blood, but, under pathological conditions, can be increased in the plasma.

The glycogen content of the plasma and serum is the same.

In the milder forms of hepatic disease the glycogen content of the blood is not disturbed, but is much increased in the case of destructive processes involving the liver parenchyma.

The glycogen content of the blood is much increased in diabetics.

In cardiac decompensation the glycogen content increases parallel with the degree of alteration in the liver.

In diseases that are accompanied by leucocytosis the glycogen content of the blood is moderately increased, while in leukæmia it is greatly increased.

A. G. NICHOLLS

Ueber den Glycogengehalt des Uteruskarzinoms und der atypischen Plattenepiethelwucherungen in Bereich des Os externums. (On the glycogen content of carcinoma of the uterus and of squamous-celled growths in the region of the external os.) Lahm, W., *Zeitschr. f. Geburtsh. u. Gynäkol.* **93**: 356, 1928.

The author has investigated the question of the glycogen content of uterine cancers of different types and at different stages. The cells in early squamous-celled epithelioma contain little or no glycogen. The amount of glycogen found increases as the cells show advancing differentiation, that is, in proportion as they approach in character the normal epithelium. In the case of cylindrical-celled cancers glycogen is present in those areas only where "cancroid" nests of squamous cells are found.

A. G. NICHOLLS

ANÆSTHESIA

Note on Spinal Anæsthesia. Pannet, C. A., *The Lancet* **2**: 1194, July 6, 1929.

During life the dural sac is held fully distended so that its internal volume cannot be increased. However much fluid is withdrawn the capacity of the sac remains the same. The place of evacuated cerebrospinal fluid is taken by an increase in the size of the numerous thin-walled vessels in the spinal and cranial cavities. There are no large vessels in the cauda equina. When fluid is injected above the cauda equina its path downwards is blocked because the sac there is distended to its fullest capacity, there being no thin-walled vessels to diminish in size to make room for introduced fluid. The fluid must travel towards the cranium, and the extent to which it will do so depends on the amount injected.

The author has devised a method of administering spinal anæsthesia based upon these physical considerations, and finds it satisfactory, even in operations on the upper abdomen. He withdraws 8 c.c. of cerebrospinal fluid. To this he adds 1 c.c. of 15 per cent novocaine in distilled water. The mixture is slowly injected, the patient turned on his side, and the head of the table lowered 5° to 10.° The injection being made between the 2nd and 3rd lumbar spaces, the 3rd and 4th lumbar nerves are anæsthetized. Fifty milligrams of ephedrine are injected hypodermically immediately after the patient is turned on his back.

W. B. HOWELL

Action de l'anesthésie rachidienne sur le motilité intestinale. (Action of spinal anæsthesia on intestinal peristalsis.) Domenech, F., *La Presse Médicale* p. 66, Jan. 16, 1929.

Spinal anæsthesia causes an immediate marked increase of intestinal peristalsis in the dog. It is as if the preganglionic fibres of the splanchnic nerves were cut. The increased peristalsis can be abolished by the administration of ether, chloroform, or atropine. The absence of peristalsis observed at operation performed under chloroform or ether anæsthesia is probably due to paralysis of the vagus.

W. B. HOWELL

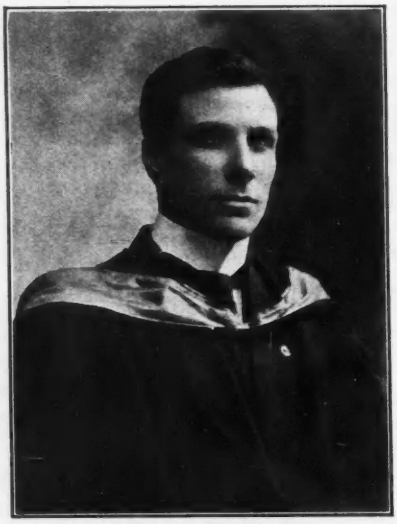
"For the mind depends so much on the temperament and disposition of the bodily organs that, if it is possible to find a means of rendering men wiser and cleverer than they have hitherto been, I believe that it is in medicine that it must be sought. It is true that the medicine which is now in vogue contains little of which the utility is remarkable; but without having any intention of decrying it, I am sure that there is no one, even among those who make its study a profession, who does not confess that all that men know is almost nothing in comparison with what remains to be known; and that we could be free of an infinitude of maladies both of body and mind, and even also possibly of the infirmities of age, if we had sufficient knowledge of their causes, and of all the remedies with which nature has provided us."—Descartes: *Discourse on the Method.*

XUM

Obituaries

Dr. Frank L. McKinnon. One of the most prominent of Winnipeg surgeons, Frank Lorne McKinnon, died in the Winnipeg General Hospital on July 16th, after a short illness.

Born at Goderich, Ont., in 1879, Dr. McKinnon came west as a child with his parents, Mr. and Mrs. Charles McKinnon, who settled near Carberry, Man. Receiving his early education from the Petrel school at Carberry, Dr. McKinnon later entered the University of Manitoba, graduating in 1908 with a bachelor of arts degree. Studying medicine in the same institution, Dr. McKinnon obtained his M.D. degree in 1912. His graduation as a doctor saw him entering the Winnipeg General Hospital for two years as a house surgeon.



Dr. Frank L. McKinnon

At the outbreak of the Great War in 1914 Dr. McKinnon enlisted with the R.A.M.C., and he was sent to Mesopotamia, where he served for four years. At the close of the war, he was decorated with the Military Cross.

A year or two after his return from the war he proceeded to Edinburgh, where he took a post-graduate course in surgery. After the completion of this course he was appointed surgeon to the Children's Hospital and Associate Gynæcologist to the Winnipeg General Hospital. He was a Fellow of the American College of Surgeons.

Always keenly interested in sport, he was a member of champion football teams of Manitoba and medical colleges, an ardent golfer and a member of the Niakwa Golf Club, and also a tennis and badminton player.

In the field of service, he was an elder first of St. Stephen's, and, later, of St. Stephen's Broadway United Church, taking an active part in the negotiations leading up to the union of the two congregations, and an active member of the Kiwanis Club.

Dr. McKinnon is survived by his widow, formerly Miss Edith Carwell, and by five brothers and two sisters; W. O. McKinnon and Simon McKinnon, of Wellwood, Man.; Oliver J. McKinnon, of Winnipeg; Alex. M. McKinnon, of Edmonton; Dr. Charles McKinnon, of Lulu Island, B.C.; Agnes Rossiter, of Edmonton, and Mrs. Thomas Richardson, of Clearwater, Man.

The funeral was held on July 18th, first from his home, 407 Wardlaw Avenue, where a private service was held, and later from St. Stephen's Broadway to Brookside Cemetery. Rev. Dr. G. A. Woodside presided and the pall-bearers were Drs. B. J. Brandson, J. D. McEachern, N. A. Warner and W. E. Campbell, A. T. Hawley, K.C., and H. Gosling.

As a man of the highest integrity, a true sportsman, and a capable surgeon upholding the highest traditions of the profession, he will be greatly missed by a wide circle of friends and acquaintances.

ROSS MITCHELL

Dr. E. E. Bryans died suddenly on July 3rd, at his residence, 160 Woodington Avenue, Toronto. He had been suffering with his heart since his return from overseas, and complaining of feeling unwell, was suddenly seized while resting on a couch. His wife discovered her husband lying on the floor. He was about to be removed to hospital when he died.

Dr. Bryans was born in Brussels, Ont., forty-nine years ago, and graduated in medicine from Trinity College, Toronto. He had practised medicine for twenty-five years, most of that time in the west. He enlisted in the Medical Corps at Winnipeg during the war, and served three years overseas as a captain. On his return from overseas he was appointed senior medical officer at the Polish Camp at Niagara-on-the-Lake. He came to Toronto five years ago, and had practised here until the day of his death.

He attended St. Barnabas' Church, and was a member of Niagara-on-the-Lake Chapter, A.F. and A.M., and St. John's Lodge, A.F. and A.M., Brussels.

Surviving are his wife, his mother and two sisters, all of Toronto.

Dr. R. E. Cooper. News was received on August 4th, at Colborne that Dr. R. E. Cooper, formerly of that district, is dead at Plymouth, Mich., as the result of a motor accident. He was born in Cramahe Township, and was a graduate of Trinity Medical College, Toronto.

Dr. George H. Cowan, a graduate of the Faculty of Medicine, University of Toronto, in 1871, and a practising physician in Napanee for half a century, died at his residence in Napanee on July 16th. For many years Dr. Cowan had been Medical Health Officer for Napanee, and also Coroner for the County of Lennox and Addington. He was born in 1848 at Princeton, Ont., where his father, Jeremiah Cowan, was one of the pioneers of Oxford County. There the last remaining member of the family, Frank Cowan, who is in his ninety-sixth year, still resides. Surviving are his widow; two daughters, Mrs. H. L. Morrison, of Ottawa, and Miss Caroline Cowan, of Boston; and one son, H. P. Cowan, of Montreal.

Dr. R. Desrochers, who formerly practised his profession in Montreal, died at St. Charles, Richelieu River, July 21, 1929. Dr. Desrochers was born on March 5, 1882, at St. Charles and was educated in the normal school in Montreal. After the completion of his preliminary studies, he entered Laval University and graduated with the M.D. degree in 1905. After graduation he practised in the Eastern Townships for eight years, coming to Montreal in 1913. Dr. Desrochers was also a good pianist, and was a member of the well known Trio Desrochers, composed of J. J. Desrochers, violinist; R. A. Desrochers, pianist, and Felix Desrochers, clarinettist.

Dr. W. Henry Fox, a graduate of Toronto University, a physician in Woodlawn, Chicago, passed away at his residence, 6220 Blackstone Avenue, on July 26th. He was a son of the late Rev. Thomas Fox, and is survived by his widow, Cecilia, daughter of the Rev. S. B. Phillips of St. Catharines; one brother, Rev. John Wesley Fox; and three sisters, Miss Annie Fox of Toronto, Mrs. Albert Jacobs of Lincoln, Neb., and Mrs. Elmer Davis of Kingston.

Dr. Fox was a member of the Chicago Medical Association, the Chicago Medical Society, and the Masonic Order, of Jackson Park A.F. and A.M.

The funeral took place from the Stone Funeral Home on July 30th to the family plot in Mount Pleasant Cemetery.

Dr. Byron Field, a highly regarded medical practitioner, and an old resident of the district, died at his home in Pickering, Ont., on August 6th, in his seventy-eighth year.

Dr. Field first practised in Pickering thirty-five years ago, shortly after he graduated from the University of Toronto. From Pickering he went to Toronto, and established his practice at Woolcott Street and Spadina Avenue. After working at his profession in Toronto for fifteen years, he was made the surgeon for the T & N.O. Railway in Northern Ontario at the time of its construction, and remained in Northern Ontario until his retirement sixteen years ago, when he returned to Pickering.

Dr. Field was born in Darlington Township, and received his high school education at Whitby. He was a member of the Masonic Order, and was a Presbyterian. Surviving are his widow, Mrs. Mildred Field; and one son, Dr. Jordon Field of St. Clair Avenue West, Toronto.

Dr. Réné Fortier, professor in Laval University, died at his home in Quebec, on August 9th, after a long illness. Georges-Emile-Réné Fortier was born at Ste. Marie de Beauce on August 4, 1866, and was, therefore, at the beginning of his sixty-fourth year.

His earlier studies were pursued at the College of Lévis and the Quebec Seminary. He received his degree in medicine from Laval University in 1890. After graduation, Dr. Fortier spent two years in Paris in the study of pædiatrics. In 1894 he was appointed Professor of Hygiene and Pædiatrics in Laval University. Among his many activities it may be noted that he became physician to the Hôtel-Dieu in 1901, and to the Crèche Saint-Vincent de Paul in 1905; he was one of the founders of the Hôpital de l'Enfant Jésus, and, from its foundation in 1927, was chief of the pædiatric service of the Hôpital du Saint-Sacrament.

Dr. Fortier married in 1896 Mlle. Alice de la Bruère, daughter of the late Hon. Pierre Boucher de la Bruère, former President of the Legislative Council of Quebec and Superintendent of Public Instruction. He is survived by his widow and six children.

Dr. Arthur Rousseau, Dean of the Faculty of Medicine of Laval University, has pronounced the following eulogy:

"Dr. Fortier was the model practitioner, extremely well informed on all subjects relating to his specialty, very devoted to his patients; he did honour to his profession. Assuredly a great moral personality disappeared at his death."

William Graham, M.D., formerly of Brussels, Ont., died at his home, 15 Alhambra Avenue, Toronto, on July 10th, in his 91st year. He was born in 1838, at Edinburgh, Scotland, and came to Canada at the age of twelve. He settled in Huron County, near Clinton; was educated at Goderich grammar school and Toronto University, graduating in medicine. He practised in Brussels for 50 years. He was one of the oldtime family physicians and a leading figure in the community. Surviving are one brother in Scotland; a sister in San Diego, Cal.; a nephew, in Stratford, Ont.; and a niece, Miss Florence Foss, of Toronto.

Dr. U. A. Hart, the oldest medical practitioner of Barrie, died on July 12th. Born and educated at Dalston, Ont., near Barrie, the deceased graduated from Trinity Medical College, Toronto, in 1896, and became a licentiate of the Royal College of Physicians and Surgeons, Glasgow, Scotland.

He first practised in Sault Ste. Marie, Ont., and for over twenty years in Barrie.

He leaves a widow and two young children; two sisters; three brothers, O. G., of Barrie; Sidney, of Weyburn; and Dr. Fred. Hart, Winnipeg.

Dr. Peter Douglas Van Kleeck, a leading medical practitioner for very many years in Armstrong, prominent also in the encouragement of local sport and in many fields of social activity, and late Liberal candidate for the Provincial House, passed away on Sunday, July 28th, at the Mayo Clinic, Rochester, Minn., whither he had gone for treatment only two weeks previously.

Dr. Van Kleeck came to Armstrong about thirty years ago, after graduating at Toronto University, and has practised in that city ever since.

He came of United Empire Loyalist stock, his ancestors having come to Ontario after the war of the American Revolution, and settled at what is now known as Vankleek Hill.

In 1914, he married Florence Alice Groves, daughter of Mr. and Mrs. Ernest Groves of Armstrong, and is survived by his widow and five children, Douglas, Barbara, Francis, Winifred, and Bruce. In addition to these, he also leaves the following sisters; Mrs. (Dr.) Kingston of Grand Forks, B.C., wife of the local member for that Riding; Mrs. Rollins, of Madoc, Ont.; Mrs. Macdonald, of Vancouver; and Miss Van Kleeck, of Edmonton, Alta. His only brother, Bruce, was killed in France in the autumn of 1918.

Dr. Van Kleeck had enjoyed for many years a very large practice in Armstrong and the vicinity, and, also, a consulting practice in the whole North Okanagan. He was highly esteemed by the profession of the Okanagan valley, and had developed into a surgeon of more than local repute.

His funeral, which took place from his home on Rosedale Avenue, on Saturday, August 3rd, attested to the esteem in which he was held, being one of the largest ever held in the Okanagan. The business houses in Armstrong were closed until 1 p.m. and flags were flying at half-mast on many buildings. The funeral arrangements were in charge of the Masons, of which he was a Past D.D.G.M.

H. W. KEITH

Dr. W. A. Lawrence. The third break in the Lawrence family of eight brothers, of whom Russell Lawrence of Bronte is a member, occurred in the death of Dr. William Allan Lawrence, aged 66, at Ithaca, N.Y. The other two brothers who died since last February, were Dr. Thomas Howard Lawrence, Mexico, and Daniel, the eldest, at Clarkson.

Son of Mr. and Mrs. Ferris Lawrence, Dr. W. A. Lawrence was born at Sheridan in 1863. After graduating from high and model schools he taught school at Fisher's Corners and in Oxford county. Later he took a medical course at Trinity College, Toronto, and graduated in 1903.

Dr. Lawrence was lecturer for a time in anatomy

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at Cornell University and later began practice at Ithaca, N.Y. He was Very Worthy Physician and Past Worthy Secretary of the Fraternal Order of Eagles; a member of the Elks, Moose, Oddfellows, Knights Pythias, the Eureka Conclave and the Ithaca Gun club. Gifted in music, he could play practically any instrument.

Surviving are: his widow, two sons, Robert and William; one daughter Mary; five brothers, Orange and Nelson, Sheridan; Cyrus, of Meskanaw, Sask.; John, of Toronto, and Russell, of Bronte. (July 31st).

Dr. A. S. Martin, aged 90, formerly of Port Arthur, and a resident of Winnipeg for the past ten years, died at his home here on July 7th. Previous to the war he had practised in Lindsay. He was born in Toronto. Mrs. Martin and four children, Mrs. L. H. McBridge, Fred. and Arthur, of Port Arthur, and Bert, of Winnipeg, survive.

Dr. O. F. Mercier, one of the best known surgeons in Canada and surgeon-in-chief of the Notre Dame Hospital, died on August 2nd, at the age of 62 after an attack of angina pectoris. Born in Montreal on December 1, 1867, Dr. Mercier was educated at the Montreal and St. Mary Colleges and took his degree in medicine from Laval University of Montreal. At the sudden end of his successful career he was professor of clinical surgery at the University of Montreal, President of the Medical Union, President of the Surgical Society, member of the American College of Surgeons, member of the Surgical Society of Paris, and President of the Industrial Medical Society.

Dr. Thomas Harvey Robinson, aged 75 years, for many years an outstanding figure in the life of Kleinburg and district, passed away on July 13th.

Dr. Robinson was a descendant of pioneer stock, his parents having emigrated from Ireland about one hundred years ago. They settled at Nobleton, where the doctor was born. Part of his early life was spent teaching in the public schools. He later studied medicine and graduated from the Toronto Medical College in 1883, when he started practice at Kleinburg, where he continued until his death. The deceased had been medical health officer and coroner for the township of Vaughan for many years. His wife predeceased him some years ago, and surviving are one son and two daughters. They are Dr. Howard Robinson, Milwaukee, Wis.; Dr. Helen Robinson, Toronto; and Miss Charlotte Robinson, also of Toronto. Besides, there is one surviving brother, George Robinson, Toronto.

Dr. Allison Turner, a general practitioner in Dutton for the past nine years, died in Queen Alexandra Sanitarium, London, on July 16th, following an extended illness, aged about 45 years. Dr. Turner was born in Southwold Township and attended the St. Thomas Collegiate Institute. He taught school at Lawrence Station for a number of years before entering the University of Western Ontario, where he graduated in medicine in 1904. He practised in Lawrence Station for several years before going to Dutton. He was a prominent member of the Masonic order and also of the I.O.O.F. He is survived by his widow; a daughter, Gertrude; and four brothers and a sister.

News Items

GREAT BRITAIN

The London School of Hygiene and Tropical Medicine

The great building which H.R.H. the Prince of Wales opened on July 18th in the presence of a distinguished company is the outcome of the recommendations made in 1921 by the Committee, under the presidency of Lord Athlone, appointed by the Minister of Health of that day, Sir Alfred Mond, now Lord Melchett. This Committee, finding that the post-graduate teaching of Public Health in London was inadequate and uneconomic, advocated the establishment of a central institution, affiliated to the University of London, wherein full provision should be made for instruction in all branches of preventive medicine.

The chief difficulty in the way of carrying this recommendation into effect was financial. The country, hard hit by the war, was staggering beneath a burden of debt and its trade and industries had not recovered from the conditions which had convulsed Europe, and indeed the whole world. Happily the Trustees of the Rockefeller Foundation in New York came to the rescue and this country gratefully acknowledges the timely assistance which that wonderful and wealthy Foundation generously extended to it in time of need. Impressed by the results of their inquiries in many lands, the Trustees had reached the conclusion that, if the gospel of hygiene, a gospel of hope and comfort, a gospel of vital importance to mankind, was to be adequately served, a great teaching centre of the type envisaged by the Athlone Committee was a necessity. Furthermore, they recognized the peculiar advantages which London presented as a site for such a school, in consequence of its traditions in public health work and organization, its medical associations, its prestige as a world capital, its position as a huge sea-port, its general relations to commerce and industry, the facilities it presents for studying well-nigh every type of hygienic problem, and accordingly they offered the Ministry of Health a sum of £460,000 towards the attainment of the project. This large sum was to be expended on the purchase of a site and on the building and equipment of an institution of the type required. The only accompanying condition was that the British Government should contribute adequately towards its maintenance.

As is well known, Mr. Joseph Chamberlain, when Colonial Secretary, founded in 1899, at the instance of Sir Patrick Manson, the father of modern tropical medicine, a school for the study of diseases of the tropics. This, the London School of Tropical Medicine, which for many years occupied premises at the Albert Docks and after the war removed to Endsleigh Gardens, was, from its commencement, under the ægis of the Seamen's Hospital Society, and had carried out most excellent and useful work and been of great service to our Colonial possessions. Negotiations with the Society led to the union of the new School of Hygiene with the London School of Tropical Medicine and there was thus formed the London School of Hygiene and Tropical Medicine, which was incorporated by Royal Charter on August 1, 1924.

The School, therefore, is charged with the duty of continuing and enlarging the instruction given in the old London School of Tropical Medicine and of providing facilities for research on the lines which have made that School famous the world over.

The type of building required for such a diversity of interests was the subject of long and careful con-

sideration and, when preliminary plans had been prepared and details worked out, a limited number of architects with experience in laboratory construction was invited to submit designs. The successful design was submitted by Mr. P. Morley Horder, and Mr. Verner O. Rees, A.R.I.B.A., in association with Mr. Horder, has carried through successfully the execution of the design so submitted.

Particular attention has been directed to the library and museum. The former will eventually be a large and representative Library of Hygiene, using this word in its widest sense, and how wide that is only those who have made the study of preventive medicine their life work can fully appreciate. The Museum, of a comprehensive and graphic type, consists of three parts, namely, sanitary engineering, hygiene in the general sense and tropical medicine. It will be open to the public and cannot fail to become a centre of propaganda and a guide to methods of safeguarding and improving the health of the people, both at home and overseas.

The School, as now constituted, has the following Divisions:

1. Public Health. This connotes a very large number of subjects. The term includes not only much that concerns environmental hygiene and the control of infectious diseases but all that relates to the health and welfare of the individual. In this Division there is a section devoted to the physiology of hygiene. In this and in other directions the activities of the public health division will be brought closely into contact with industrial problems and should play a notable part in assisting both the employer of labour and the employed.

2. Epidemiology and Vital Statistics. The two subjects are closely linked and the division itself stands in close relationship to all the other divisions and should play a great part in training students to become careful observers and recorders, the while it continues to cast light in dark places and to subject the results of research work to the acid test of statistical accuracy.

3. Bacteriology and Immunology. This, a most progressive division, has already, in temporary quarters, been doing fine work in training men and women who have decided to follow bacteriological careers, both at home and abroad.

4. Biochemistry, including a Department of Chemistry as applied to Hygiene. It is often said that "the future lies with the biochemist," and there can be no doubt that many of the most important problems in preventive medicine can only be solved by his skilled help. The biochemical work will in the main be of a research nature but the Department of Chemistry, while not ignoring research, will be largely concerned with training the public health student in the analysis of water, sewage and food, in the examination of disinfectants and in the relations which chemistry bears to industry so far as hygiene is concerned.

5. Medical Zoology. This large division, embracing the departments of protozoology, helminthology and entomology, is, apart from the prosecution of research, chiefly concerned with the training of medical men and women destined for the tropics. At the same time instruction will be afforded students proceeding to degrees and diplomas in public health, to those attending the School at the instance of the League of Nations for the study of malaria, and to others professing one or more of the three subjects above mentioned. An aquarium and large insectarium are features in the equipment of this division.

6. Tropical Medicine and Tropical Hygiene. This embraces the all-important clinical work in diseases of the tropics for which facilities are afforded by the Hospital for Tropical Diseases, Endsleigh Gardens, now Gordon Street, which, under the auspices of the Seamen's Hospital Society, will continue in close touch with the School.

Associated with this clinical work is the study of applied pathology, as distinct from the pathology of protozoal and helminthic infections. It is concerned largely with questions of technique and is of the utmost importance to the physician practising in the tropics.

Tropical hygiene figures in this division and its study indicates the modifications which the climate and conditions of countries in the torrid zone impose upon the pursuit of the hygienic ideal.

Such is the constitution of the School for teaching and research work. Its staff being in contact with other official research organisations, exceptional opportunities will be forthcoming whereby students may acquire experience of the way in which large scale investigations of public health problems are planned and conducted, while its association with officials of the public health service will ensure adequate practical instruction in field work, both urban and rural.

It possesses an entomological field station at Farnham Royal and, thanks to the Ministry of Agriculture, an Institute of Agricultural Parasitology at St. Albans, which provides opportunities and material for teaching and research work in medical zoology.

On the tropical side it co-operates with the Government of Southern Rhodesia in the work of a field station at Salisbury, and frequently sends members of its staff abroad for purposes of study and research. In its new home it will look forward confidently, provided ample funds for maintenance are forthcoming, to an extension of its work and to the full attainment of the great purpose for which it has been brought into being and which may be expressed shortly, simply, yet adequately, in four words, "the Welfare of Mankind."

The Fifteenth Annual Conference of The National Association for the Prevention of Tuberculosis will be held at Newcastle-upon-Tyne on October 10th, 11th and 12th, 1929. Further particulars may be obtained from the Secretary, 1, Gordon Square, London, W.C.1.

The Morison Lecture

It is announced that Dr. S. A. Kinnier Wilson (London) has been appointed Morison Lecturer for 1930, at the Royal College of Physicians of Edinburgh.

Gifts from the late Lord Revelstoke

The late Lord Revelstoke, in addition to his gift of £100,000 to King Edward's Hospital Fund for London, of which he was treasurer, has left £50,000 to Guy's Hospital, and £25,000 to St. Mary's Hospital Medical School.

NOVA SCOTIA

A special meeting of the Halifax Branch of the Medical Society of Nova Scotia was held at the Nova Scotia Sanatorium, Kentville, on July 18th. About twenty-five members motored to Kentville, and after partaking of the hospitality of Dr. Miller, superintendent of the sanatorium, who entertained the party at dinner, listened with much interest to an address by Dr. Miller, in which he outlined his ideas of the means by which the tuberculosis problem in the province might be more adequately dealt with.

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Seemingly, credit is due to a number of Halifax physicians for assuring at least the immediate future of the Crousetown Fish Club. The president of this important organization, who has guided its affairs with singular acceptance for some years, was bent upon relief from the great responsibility imposed by his high office, but the impassioned appeals of Drs. E. V. Hogan, H. K. MacDonald, and S. R. Johnston were successful in securing a distinctive reconsideration, and the membership of the club is temporarily relieved of the dread of serving under a new and untried president. It is related that the veteran president indicated to at least one of the medical members that he would brook no interference with his prerogatives as long as he remains in office.

The purchase of additional property for the site of the new Halifax Infirmary permits of considerable modification of the plans which were prepared for the buildings. This will occasion some delay in the commencement of operations, but this is of little consequence in comparison with the greater convenience which is expected to result from the revision of plans.

Construction work on an addition to the Payzant Memorial Hospital, Windsor, is now well advanced. When it is completed, the accommodation will be almost doubled.

Those who advocate making Nova Scotia a restricted area in respect of bovine tuberculosis have found many who do not see eye to eye with them. Before and during the recent provincial election the matter, very unfortunately, we think, was made a political issue. This did not favour an entirely reasonable attitude by either pros or cons. Some opponents of the scheme refuse to allow their cattle to be submitted to a second tuberculin test, and it is said that legal action is to be taken against them. While primarily intended for the improvement of stock, the effort to eliminate tuberculosis from herds of cattle interests those of our profession who wish to note what influence the reduction of bovine tuberculosis may have on the incidence of tuberculosis of bovine type in the human.

A fine portrait of Dr. John Stewart has been placed, by an admiring friend, in the Sutherland Memorial Hospital, Pictou. Dr. Stewart practised in Pictou for many years and was active in creating a sentiment in favour of the establishment of a hospital in that town.

Dr. H. A. MacKeen has been appointed Assistant Professor of Bacteriology at Dalhousie University, to take duty before the opening of the next session. Dr. MacKeen is a son of the late Dr. R. A. H. MacKeen, of Glace Bay, whose memory is held in affectionate esteem by all who knew him. Graduating at McG[illegible] in 1924, the new professor has since followed work in pathology at the Montreal General Hospital and the Boston City Hospital, and has been on the teaching staffs of the medical schools of McGill and Tufts Universities.

Dr. J. G. D. Campbell has been appointed to the medical staff of the Children's Hospital, Halifax.

Drs. J. R. Corston and G. R. Burns have been appointed assistant physicians to the Victoria General Hospital, Halifax, and Dr. W. G. Colwell has been appointed assistant gynæcologist to the same hospital.

Recent defectors from bachelordom include Drs. A. E. Doull, Jr., Halifax; E. W. MacDonald, Reserve; P. L. Oxley, Northport; J. C. Wickwire, Liverpool; S. Marcus, New Germany; and W. G. Colwell, Halifax.

The Town Council of North Sydney has endorsed the proposal of the Board of Health of that town to immunize school children against diphtheria.

The will of the late A. Milne Fraser, of Halifax, provides for a bequest of $30,000.00 towards the cost of a hospital at Kentville. Some months ago Mr. G. E. Calkin, of Kentville, gave a property valued at approximately $40,000.00 for hospital purposes. A Commission has been formed which will endeavour to meet the conditions of the Fraser bequest and to assure the erection of a hospital within a short time.

Mr. C. W. Startup, a graduate of the University of Aberdeen, has been appointed assistant in physiology at Dalhousie University. Part of Mr. Startup's training was obtained under Professor J. J. R. MacLeod, recently of the University of Toronto, but now in charge of the department of physiology at Aberdeen.

All sixteen candidates who wrote the June examinations of the Medical Council of Canada at Halifax were successful in passing in all subjects. One candidate is a graduate of McGill; the others are Dalhousie graduates.

Dr. J. W. MacLean, of North Sydney, has returned from a much enjoyed trip to the mother country.

W. H. HATTIE

NEW BRUNSWICK

The Nesbit wing of the Saint John County Hospital is rapidly progressing. In this connection, several new expenditures have been necessitated, including new sun porches, new corridors, and a film storage building separate from the main building. The necessity for the new children's wing, provided by Mr. Nesbit, is evidenced by the waiting list of young patients desirous of treatment at the institution.

At the last meeting of the Saint John Ambulance Association, a handsomely illuminated vote of thanks, passed by the Grand Priory of London, was presented to Dr. G. G. Melvin, Medical Health Officer of New Brunswick. Dr. Melvin's support and aid has materially assisted the Saint John Ambulance Association's work in the province.

The newly appointed house-staff of the General Public Hospital, Saint John, comprises Dr. O. McDonald (McGill), Dr. A. L. Donovan (McGill), Dr. Irene V. Allen (Dalhousie), Dr. J. P. McInerney (McGill), and Dr. A. L. Winsor (Queen's).

Dr. Donald Porter, lately of Minto, has begun his practice in Saint John. He will specialize in pædiatrics.

Dr. Joseph Tanzman, a recent interne at the General Public Hospital, has started practice in Saint John.

Dr. W. F. Roberts has associated with himself in practice Dr. D. W. Buchanan.

Dr. O. B. Evans sailed this month to pursue surgical studies at Edinburgh.

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Dose: Prophylactic---one to two drops daily. Curative---graded to the severity of the condition, one to two drops twice daily is an average dose.

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QUEBEC

A campaign to provide funds for the erection of a Jewish General and Maternity Hospital containing at least 150 beds will be held in Montreal from September 22nd to 30th. The minimum sought is $600,000, but the committee in charge of organization confidently expects that a much larger sum will be realized. This decision to add to the hospital accommodation of the city has been made as a result of an exhaustive survey of the hospital situation conducted by members of the Jewish community. A deplorable shortage was revealed, and the provisional committee was convinced that the Jewish citizens would do something toward ameliorating the prevailing conditions. When built and equipped the proposed hospital will be open for all citizens without consideration of race or religion. The existing Jewish Maternity Hospital, temporarily closed, will be merged with the new institution. No site for the Jewish Hospital has been chosen, but several are under consideration. The latest and most modern ideas of hospital service and interior arrangements will be incorporated into the plans. For the purposes of the campaign, the metropolitan and outlying districts have been divided into twenty-five zones with a district chairman, zone chairman, and captains in each unit. Approximately twelve hundred active solicitors will be enlisted to canvass for funds. Every town and city in the Province of Quebec will be canvassed and the Jewish residents given an opportunity to co-operate.

Dr. Casey A. Wood, whose professional career began in Montreal, is residing in London for two years. He is preparing a catalogue, with notes, for the works on vertebræ zoology and general biology in the libraries of McGill University, in all about 10,000 titles.

The efficacy of the use of serum in the treatment and cure of infantile paralysis has recently been emphasized by Dr. C. F. Martin, Dean of the Medical Faculty at McGill University. Dean Martin referred specifically to the recent epidemic in Winnipeg, when the serum proved to be of inestimable value. He says: "The full value of medical science reaches comparatively only a few people. Large numbers of individuals still suffer and die from conditions which can and should be prevented. It is, of course, self-evident that it is of no practical value for us to know, as we do for example, that the blood serum from convalescent infantile paralysis cases will prevent the occurrence of paralysis or lessen its severity in new cases, if given in time, unless we make use of such knowledge. Experience has shown the value of convalescent serum. The results in Winnipeg, last year, gave striking confirmation. Among those treated with convalescent serum, there were no deaths; 93 per cent made a complete recovery; 7 per cent had some paralysis. The group who did not receive serum showed 11 per cent of deaths; 63 per cent with paralysis; and only 26 per cent made a complete recovery. No one can say when we may need convalescent serum, but we would certainly be well advised to be prepared if the need should unfortunately arise. The serum must be used before the paralysis develops. We cannot wait to collect convalescent blood until cases appear, because this procedure takes too long. We must have the serum ready for the eventuality." A few cases of poliomyelitis have made their appearance in Montreal and steps are being taken to have in hand a supply of the necessary immune serum.

GEORGE HALL

MANITOBA

In an offer communicated to the provincial government the sisters of St. Boniface Hospital propose to erect a tuberculosis sanatorium with a present capacity of 125 beds. The hospital is prepared to increase the new institution to 200 beds. Plans for the installation of a radium emanation plant are also being considered. The offer of a new sanatorium is made possible by the generous offer of a wealthy lady, formerly a resident of Manitoba. It is understood that her gift is made on the sole condition that it be used for the construction of a sanatorium for tuberculous patients. The offer is being considered by the provincial government.

Two Winnipeg physicians, Dr. Bruce Chown and Dr. Jos. L. Jackson, have recently received awards from the Banting Research Foundation to enable them to carry on research work in connection with pyelonephritis in children and a histological study of the thyroid gland respectively. Dr. Bruce Chown is pathologist to the Children's Hospital and physician in charge of out-patient tuberculosis and cardiac clinics, while Dr. Jackson is Lecturer in Anatomy in the Medical School.

The staff of the Manitoba Sanatorium, Ninette, are conducting clinics at various points throughout the province.

Dr. W. Harvey Smith of Winnipeg, President-Elect of the British Medical Association, was present at the annual meeting of the Association in Manchester.

ROSS MITCHELL

SASKATCHEWAN

A post-graduate team, consisting of Dr. J. A. Nutter, Clinical Professor of Orthopædic Surgery, McGill University, and Dr. H. E. MacDermot, Demonstrator in Medicine, McGill University, and Director of the Chest Clinic, Montreal General Hospital, toured Saskatchewan in July. In spite of the fact that the meetings were held in the holiday season they were well attended.

Tenders for a new nurses' home at the Regina General Hospital have been let. The new home is to accommodate 228 nurses and will be finished in the spring.

When the authorities of the Regina Exhibition learned of the birth of an Indian baby at the Indian encampment on the Fair grounds they notified the V.O.N. nurse who found a healthy infant of seven pounds. The red calico rag that was used by the old Indian woman obstetrician as a cord tie was changed for something more aseptic. The Regina Branch of the V.O.N. gave the child a complete layette.

A AND D

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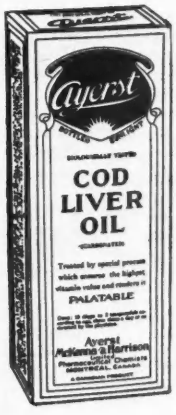
VITAMIN A

Increases resistance. Now employed by leading clinicians as a valuable anti-infective agent, particularly in treatment of conditions affecting the respiratory tract. Its use has been more recently observed in other infective conditions—see Mellanby and Green—B. M. J., June 1st, 1929.

In many cases where Vitamin A may be particularly indicated, Vitamin D, with its specific influence on Calcium and Phosphorus metabolism is also highly desirable.



VITAMIN D

Generally accepted in the prevention and treatment of rickets. Widely prescribed during pregnancy and lactation to improve Calcium and Phosphorus metabolism. Also indicated in neurasthenia and fatigue where an upset may have occurred in the balance between the sedative and stimulating tissue bases, due to a diminution of the sedative calcium factor.

In all these conditions where Vitamin D is particularly indicated, it is now generally accepted that the resistance must also be increased by an adequate supply of Vitamin A.

These complemental vitamins are more abundantly available in pure Cod Liver Oil than in any other food material. Ayerst "Bottled Sunlight" brand is biologically standardized to insure a reliable content of both Vitamins A and D.

Note: In cases where patients may be unable to take a pure Cod Liver Oil without discomfort, Ayerst "Calcium A" capsules will be found useful in overcoming the difficulty. Each capsule contains a small quantity of organically combined Calcium and Phosphorus together with the Total Vitamin content of approximately one teaspoonful of Ayerst biologically-tested Cod Liver Oil in the form of a concentrate. These are supplied in packages of 100 capsules each, ready for dispensing.

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XUM

Dr. John G. Grant formerly with the Pædiatrics Department of Strong Memorial Hospital, Rochester N.Y., has opened an office in Regina. His practice is limited to diseases of infants and children.

Dr. Beattie Martin since his return from Europe is limiting his practice to orthopædic surgery.

LILLIAN A. CHASE

ALBERTA

The question has been asked; when is a patient an indigent? This is a moot point which requires interpretation by judicial enquiry. To the municipal officers of many rural districts, the words "indigent" and "pauper" are synonymous. Yet, even though a man may have no crop or be earning half wages to keep a family, since he has an equity in a farm or a house, he is not an indigent.

Recently a country physician was called eighteen miles to attend a maternity case, but owing to the poverty of the family no bill was rendered. Later one for $25.00 was sent to the municipality. The doctor had paid $9.00 for his transportation. The municipality refused to pay, as the man had bought a farm on crop payments, paying $25.00 in cash to close the transaction. This year he has fourteen acres in wheat, half of which goes in the purchase price of the farm. It was quite evident that this man, who was an invalid and crippled for life, was without available means to settle the doctor's bill, yet the municipality declined to meet the account. The doctor in question is considering the advisability of bringing suit, in order that he may establish the debatable point as to what is the meaning of the term indigent. Until last year the physicians of Alberta rendered free services to patients which if estimated at reasonable rates would have amounted to more than the sum total of the entire health budget of the Alberta Government.

A large attendance is expected at the annual meeting of the Alberta Medical Association to be held in Lethbridge, on September 17th, 18th and 19th. Besides those who will come from Montreal and Toronto under the Canadian Medical Association's grant for post-graduate work and the personnel of the list of lecturers which has been referred to in the June number of the *Journal*, a number of local men will also contribute to the program.

A symposium on "Artificial Immunity in Tuberculosis" has been arranged and Professors A. C. Rankin, J. J. Ower, H. M. Vango, R. M. Shaw, all of the University of Alberta, will take part in the discussion.

Extensive additions are being made to the university Hospital and to the Royal Alexandra Hospital, Edmonton, which will give upwards of one thousand beds for the four hospitals in this city.

Dr. G. E. Learmonth has returned to Calgary, having spent several weeks visiting hospitals in Montreal and New York.

Dr. F. C. Clark, who for several years prior to the war practised in Calgary, is once more with us, we are pleased to state. Following the war he practised in the West Indies.

Dr. J. W. Auld has returned from Philadelphia, where he spent several weeks in genito-urinary post-graduate work.

Mention has been made in a recent number of this *Journal*, regarding the appointment by the Department of Health of this province of women physicians to undertake medical practice in outlying districts. One of the first to be appointed is Dr. Helen O'Brien, who will look after the physical welfare of the inhabitants in the district of Lac la Biche. A second appointment has been made in the person of Dr. Mary Percy, who has been placed at Notikewin in the Peace River District. Dr. Percy came from Great Britain under special arrangements with the Department of Health.

Dr. Ford Tallmann of the staff of the Provincial Mental Hospital at Ponoka has been granted leave of absence for post-graduate work in New York City. He will spend two years there in special studies.

Dr. J. C. McKie, of Wainfleet, Ont., has applied for registration in Alberta and, in the meantime, before deciding on a location, is acting as locum tenens for Dr. Worthington at Canmore.

Dr. E. E. Rogers of Redcliff has disposed of his practice to Dr. A. E. Ward of the University Hospital, Edmonton. Dr. Rogers will practise in British Columbia.

Group practice is undoubtedly growing in Alberta. During recent months four different groups of physicians and surgeons have increased their numbers. There is one aggregate of five doctors, one of six, and still another of eight.

Dr. Samuel Morris, formerly of Brule, has returned from post-graduate work in New York and other centres. He has joined the Calgary Associates Clinic where he will devote himself to physiotherapy.

Among those who have recently registered with the College of Physicians and Surgeons are the following: Drs. A. C. McGugan, J. G. McKie, W. C. Campbell, R. K. Start, V. L. Annett, H. F. P. Grafton, H. R. Christie and Margaret Owens.

G. E. LEARMONTH

BRITISH COLUMBIA

A new branch of the British Columbia Medical Association has just been organized with headquarters in Prince George. The new organization will be known as the Cariboo Medical Association, and commences its activities with Dr. E. J. Lyon, Prince George, as President; Dr. Gerald Baker, Quesnel, Vice-president; Dr. C. Ewert, Prince George, Secretary, and Dr. J. T. Steele, Ciscome, and Dr. H. S. Trefry, Prince George, members of the executive.

The extra-mural post-graduate tour of the province, under the auspices of the British Columbia Medical Association, made possible by the generosity of the Sun Life Assurance Company, visited points in the Okanagan and Kootenay from June 19th to June 24th, when Dr. Norman B. Gwyn, of Toronto, spoke on "Rheumatic fever and the present day views as to its etiology"; "Anæmia and blood disease"; "Coronary thrombosis and angina"; and "Encephalitis."

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Its safety and efficiency have been demonstrated on infants at five universities and by hundreds of physicians in the United States.

Our book containing over 300 references on its administration to infants and animals will be sent to any physician.

DOSES

To promote proper growth of teeth of child *in utero*, give mother 20 drops daily. To protect infants from rickets, give 8 to 10 drops daily. For premature infants, 15 drops daily. For curative dose, 15 to 20 drops daily. For severe rickets, 20 to 30 drops daily.

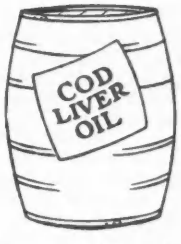
ADVANTAGES

Vitamin D potency always uniform and dependable. Every lot standardized by biological assay. Can be given by drops instead of teaspoonfuls. No unpleasant taste or odor. Affords greater protection than any known antiricketic substance.

1/10 Gram

Acterol may be given in any food prescribed by physicians for infants and children. It adds vitamin D value to such foods as milk, vegetable soups, puddings, jellies, ice cream, etc.

1/10 gram of activated ergosterol is equivalent in vitamin D potency to



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Dr. T. McPherson, of Victoria, spoke on "The gall-bladder" and "Duodenal ulcer." Dr. D. E. H. Cleveland, of Vancouver, took as his subjects "The diagnosis and treatment of certain common diseases of the skin" and "The skin manifestations of syphilis."

Following the Summer School of the Vancouver Medical Association, meetings were held at Victoria, Nanaimo and New Westminster, at which Dr. H. E. Ridewood of Victoria, took the surgical subjects, and the party then proceeded to Prince Rupert, where meetings were held on July 5th, and to Prince George, for the final sessions on July 8th.

The attendance at all the meetings was exceptionally good and general satisfaction was expressed by all those attending. The uniform success of these meetings is the best proof of the excellence of the conception of this scheme, and must be a source of gratification to its founders.

The Vancouver General Hospital has completed the furnishing of the private ward pavilion, and, with this now in operation, some relief in the shortage of hospital beds, which has been so acute, is now promised. At present the main building is being renovated, and more modern plumbing and wiring being installed. As portions of the old building have been in continuous operation since 1907, it is not surprising that present-day requirements had not been in all respects anticipated.

The Medical and Dental Building in Vancouver is rapidly nearing completion, and has already a good many tenants. While much of the interior is as yet unfinished, elevator service is now in operation, and amongst the new occupants are the Vancouver and British Columbia Medical Associations, and the Medical Library of the former Society. The Council of the College of Physicians and Surgeons is also taking an office with the above organizations, so that the administrative departments of all these medical bodies will shortly be housed together. The new quarters will provide an administrative office, with separate rooms for the Registrar of the College, and the Executive Secretary of the British Columbia Medical Association. Beyond this, on the right hand, is the stack room of the Library, with an office for the Librarian. Directly adjoining the executive office is a Committee Room available for meetings of Committees, or Reading Clubs, while on the left is the Reading Room. The latter is well-lighted and overlooking Christ Church, presents an excellent view of Georgia Street.

Word has been received of the death, at Rochester, of Dr. Peter D. Van Kleeck of Armstrong. It is understood that Dr. Van Kleeck had consulted the Mayo Clinic with regard to a disability resulting from an accident received last year, during the course of some alterations to his residence, but we understand that a fatal outcome had not been anticipated.

Dr. J. M. Jackson, of Nakusp, has recently joined the staff of the Provincial Mental Hospital at Essondale, and his practice has been taken over by Dr. H. F. Tyerman.

Dr. A. F. Gillis of Merritt, has recently returned from a holiday in the east.

Dr. H. H. Boucher, who has been practicing in Atlin, has removed to Vancouver, and is associated with Dr. D. McLellan.

Dr. F. G. Logie is at present at Kimberly where he is relieving Dr. D. W. Davis.

Dr. R. D. Nasmyth is acting as locum tenens for Dr. H. B. Rogers of Chemainus.

Dr. J. M. McDiarmid of Abbottsford, who was recently married to Miss Vida McDonald, a graduate of the Vancouver General Hospital, has returned after a month's holiday. During his absence his practice was cared for by Dr. F. G. Logie.

C. H. BASTIN

UNITED STATES

The International Medical Club, New York

The International Medical Club of New York is an institution which aims at the promotion of social and scientific relations between American medical graduates and medical practitioners of other countries who are visiting, residing, or practising in the United States. It keeps in close touch with the various medical societies in that country, and is therefore in the position to advise and assist medical practitioners who are touring and wish to visit medical institutions. The club has interested itself particularly in medical progress in foreign countries, and has a number of corresponding members in Europe; information is made available also as regards post-graduate instruction in Great Britain. Members of the British medical profession who would like to know more about this institution should write to the chairman of the Liaison Committee, Dr. F. H. Allbee, 30, East 40th Street, New York City.

New York Bars Cellulose Nitrate Film for X-Ray Purposes

As a result of the Cleveland Clinic catastrophe and a similar fire in an Albany, N.Y., hospital, a year ago, a special committee was appointed by Acting Governor Lehman of New York State, to investigate the hazard attendant upon the use of cellulose nitrate x-ray films in institutions. Following this probe, the State public health council has adopted a rule amending the New York sanitary code, effective September 1st, reading:

"The sale or distribution of cellulose nitrate film for x-ray purposes is hereby prohibited."

GENERAL

A post-graduate course in Medicine is announced to take place at St. Michael's Hospital, Toronto, from September 16, 1929, to September 20th inclusive.

The syllabus to be presented is as follows:—

Sept. 16th

9–10 a.m. Irregularities of Heart
Dr. D'Arcy Prendergast.

10–11 a.m. Rheumatic Fever
Dr. A .R. Hagerman.

11–12 " Cancer
Dr. W. B. Edmonds.

12–1 p.m. Neurosyphilis
Dr. Julian Louden.

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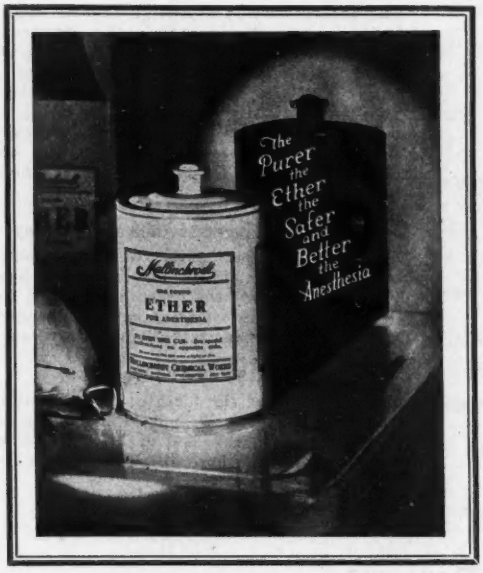
A PURE, *STABLE* ETHER

for ANESTHESIA



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3. An air tight mechanical closure eliminating any possible introduction of impurities.

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XUM

Sept. 17th
9–10 a.m. The Diagnosis of Tuberculosis of the Chest
Dr. J. H. Elliott.
10–11 " Relation of the Heart to General Disease
Dr. H. McPhedran.
11–12 " Jaundice
Dr. Julian Louden.
Sept. 18th
9–10 a.m. Duodenal and Gastric Ulcer
Dr. A. J. MacKenzie.
10–11 " Skin Diseases
Dr. F. C. Harrison.
11–12 " Hypertension
Dr. Hagerman.
12–1 p.m. Anæmia
Sept. 19th
9–10 a.m. Duodenal and Gastric Ulcer
Dr. A. J. MacKenzie.
10–11 " Treatment of Tuberculosis of the Chest
Dr. J. H. Elliott.
11–12 " The Non-Tuberculous Chest
Dr. Broughton.
12–1 p.m. Myocarditis
Dr. McPhedran.
Sept. 20th
9–10 a.m. Allergy-Asthma, etc.
Dr. A. E. Broughton.
10–11 " Goitre
Dr. D'Arcy Prendergast.
11–12 " Epilepsy
Dr. W. B. Edmonds.
12–1 p.m. Bronchitis
Dr. R. T. Smylie.

At each lecture cases will be demonstrated as much as possible. Each afternoon a great many cases will be shown throughout the wards and all new methods of treatment will be demonstrated. The hospital, of course, will be open to medical visitors. There will be no charge.

All who desire to take this course should communicate with Dr. W. B. Edmonds, Medical Arts Building, St. George and Bloor Streets, as soon as possible.

Experiments on Animals

The antivivisection campaign started some years ago in Belgium has culminated in the adoption by the legislature of the following proposal for the protection of animals: "Vivisection experiments carried out for the purpose of research or demonstration shall take place only in university laboratories, or in laboratories of similar status, under the control of the responsible director, and, with prescribed exceptions, only on anæsthetized animals." Approval of such laboratories will be conferred by royal decree.

The League Against Cancer (France)

The French League against Cancer announce that donors have placed at its disposal two prizes of 100,000 francs each for the encouragement of research on cancer. Further information can be obtained from La Ligue Contre le Cancer, 2 Avenue Marceau, Paris.

E. F. W. Pflüger

The centenary of the birth of the famous physiologist Eduard Friedrich Wilhelm Pflüger, the founder of *Pflüger's Archiv*, who died in 1910, was celebrated on June 7th at Bonn, where he was professor for fifty years.

Book Reviews

Diseases of Children; first edition edited by Sir Archibald E. Garrod, K.C.M.G., F.R.C.P., F.R.S., the late Frederick E. Batten, M.D., M.A., F.R.C.P., and Hugh Thursfield, D.M., M.A., F.R.C.P.
Second edition, edited by Hugh Thursfield, D.M. (Oxon), M.A., F.R.C.P., Physician, Hospital for Sick Children, Great Ormond Street; and Physician, St. Bartholomew's Hospital, and by Donald Paterson, M.D. (Edin.), F.R.C.P., Physician to Out-Patients, Hospital for Sick Children, Great Ormond Street, Physician in charge of Diseases of Children, Westminster Hospital.
Toronto, The Macmillan Company of Canada; London, Edward Arnold & Co., 1929.

The Canadian profession will, we are sure, welcome a new edition of this English treatise on the Diseases of Children to the pages of which 37 of the leading pædiatrists in Great Britain have contributed; we note also that the majority of the contributors are actively connected with the Hospital for Sick Children, Great Ormond Street; a hospital whose reputation for research has stood high for nearly a century.

The scope of this volume of 1,100 pages is extensive, and includes the description and treatment of all ailments of infancy and childhood. It is written in excellent diction, so that reading is a pleasant task.

The volume opens with two introductory chapters. The first treats of heredity and the influence of the germ-plasm and Mendelian laws on the development and characteristics of the new living being. In the second, the writer discusses the theories of acquired and natural immunity, and the application of its known principles to the prophylaxis of disease. This chapter includes also rules for the administration of sera and the transfusion of blood.

The subject of infant feeding and its occasional difficulties, together with the food requirements of the growing child, are fully dealt with in the first chapter by Dr. Edmund Cantley and Dr. Donald Paterson. The chapter on diseases of nutrition, written by Dr. Leonard Parsons of Birmingham, and well illustrated, treats of the various types of infantile atrophy, tetany, and of rickets in all its phases. Attention is called to late rickets manifesting itself chiefly in bony deformities of the knees and legs and associated with cœliac disease and renal infantilism. The chapters on infantile scurvy and on the several forms of œdema met with in childhood are from the able pen of Dr. G. F. Still. Diseases of the alimentary system are discussed by the editors in a series of sub-chapters. In this section Mr. A. T. Pitts presents an interesting article on oral hygiene and the defects met with in childhood in the teeth and jaws; following this the surgical treatment of cleft palate and hare-lip is fully dealt with by Mr. H. D. Gillies, plastic surgeon to the Ministry of Pensions Hospital, Roehampton.

Diseases of the naso-pharynx and diseases of the respiratory system are clearly described and the most modern views in treatment are inculcated. In the chapter on diseases of the heart the readers are presented with a full and practical paper by Dr. George Sutherland. After a detailed consideration of the three important systems in the heart, the genetic or conducting system, the muscular contractile system, and the valvular system, he treats his subject from its clinical aspect, and describes conditions met with under the following sub-heads: subjective symptoms in heart disease; circulatory disturbances; acute affections of the heart; chronic heart disorders; the heart in acute infections; prognosis and treatment in its various disorders; congenital heart disease; diseases of the vessels; and Raynaud's disease. The chapter on

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diseases of the hæmopoietic and lymphatic system by Dr. Thursfield presents the reader with a clear picture in excellent diction of a somewhat difficult subject. Sir Hector Cameron's article on functional diseases of the nervous system is ably presented and is one of the most important essays in the volume, and should be read by every member of the profession who has to deal with nervous conditions in children. Dr. T. F. Poynton writes the article on rheumatism and chorea. The chapters on infectious disease are clearly presented and well up to date both in prophylaxis and treatment.

We have read this volume with much pleasure. In our review we have only referred to a few of the more important chapters, but in all, the text is everywhere up to date. The illustrations are original and representative, and the type is very readable. The book is cordially recommended to our readers.

A. D. BLACKADER

Arthritis and Rheumatoid Conditions—Their Nature and Treatment. Ralph Pemberton, M.S., M.D., Physician to the Presbyterian Hospital and Associate Professor of Medicine in the Post-Graduate School, University of Pennsylvania. 354 pp., 42 engravings. Lea and Febiger, Philadelphia, 1929.

The author, who has made an intensive clinical and laboratory study of arthritis for the past fifteen years and has written articles on his work and observations in journals and text-books, presents in the compass of a monograph the results of a long series of observations. He has added critical considerations of the work of other investigators in this field, presenting the subject in such form as to offer the general practitioner a wide view of the subject, with indications for practical application of methods of treatment.

He is not obsessed with the idea that focal infection will explain the problem of chronic arthritis. The etiology is considered under such heads as The Rôle of Infection, The Influence of Bacteria, The Influence of Heredity and Constitution and Clinical Data bearing on the Etiology. Pathology is fully discussed, as is symptomatology and treatment. Specific types of arthritis receive separate consideration. The discussion of therapy is exhaustive without being prolix. It includes the treatment of focal infections, intestinal scources, vaccines, physiotherapy including heat, massage, exercise, diathermy, ultra-violet light, dietetic measures and medicinal therapy.

The writer is not a pessimist as regards results of active measures. He believes in vigorous treatment with sustained and intensive effort; that arthritis is not to be considered an incurable disease, that in fact there are few disease states for which more can be done.

The volume is a splendid presentation of the subject which every practitioner will find most useful and helpful.

J. H. ELLIOTT

Recent Advances in Bacteriology and the Study of Infections. J. Henry Dible, M.B., M.R.C.P. 363 pages, 22 illustrations. Price 12/6. J. & A. Churchill, London, 1929.

Nowadays there is no branch of medicine with which it is easy to keep abreast. In accordance with the famous classification of whiskeys one may say that there is no such thing as an easily comprehended specialty; only, some are much more difficult to keep up with than others. Bacteriology will readily be admitted to belong to this latter group, and a book which deals with it in accordance with the "Recent Advances" methods is distinctly welcome.

The author shows how really difficult it is to compress such an immense and complex subject and yet make it intelligible. He has tried, however, to take a broad view of many subjects, and to present a readable account of recent work which may be easily grasped by the general reader. Such a task requires not only sound knowledge but clear presentation, and Dr. Dible shows himself to be well qualified in both respects.

It is difficult to pick out any one chapter for special mention; perhaps that dealing with "The Streptococcus Problem" is amongst the best in its arrangement. In many cases an adequate historical comment is made. Some of the chapter headings are as follows, "The Bacteriophage"—an excellent summary of what promised so much and has not brought forth the fruit that was hoped for; "Calmette and B.C.G.", in which the conservative view is well upheld by statistical and experimental evidence; "Ultramicroscopic and Filter-passing Viruses," to which three chapters are devoted, a proof of the place occupied by this subject in modern bacteriology; "Recent Work on the Pneumococci," on "Spirochætal Infections," etc.

These are but a few of the points dealt with. They are mentioned to show something of the variety of material in a book which is a most useful addition to the growing series of summaries on medical subjects.

H. E. MACDERMOT

Indigestion; Its Differential Diagnosis and Treatment. Herbert J. Paterson, M.D. 153 pages. Price 7/6 net. William Heinemann Ltd., London, 1929.

The author states that this book is for clinical use and that references to statistics, etiology and pathology have been omitted.

He insists on the great importance of a careful history and emphasizes how much can be learned from a gastric analysis, which can be so easily carried out. He goes into this latter point in some detail.

At the beginning of the chapter on indigestion of intestinal origin the author says: "It is probably not an exaggeration to state that a large proportion of cases of indigestion are secondary to causes outside the stomach." This seems to anybody who has had to do with hospital and particularly out-patient practice to be a most moderate estimate of the facts.

In speaking of colopexy he says: "Like the other pexies I have never seen any benefit accrue from it."

Forty-three pages are devoted to gastric and duodenal ulcer. He thinks vomiting is a more common symptom than is usually supposed, and says it occurred in 60 per cent of his duodenal cases. This would be some 20 per cent higher than other estimates of this symptom in cases without organic obstruction.

In the treatment of ulcers, both gastric and duodenal, he insists on rest in bed for six to nine weeks, does not allow fish for 6 weeks and no "butcher's meat" for six to nine months. His account of the Sippy diet is incorrect as to quantities, time of giving and the composition of the powders, and he thinks its exponents claim too much for it, exhibiting as he says "an innocent optimism."

For the surgical treatment of both gastric and duodenal ulcers he prefers gastro-enterostomy and says he has only 10 per cent of unsatisfactory results with gastric ulcer cases, which is not quite so good but safer than when gastrectomy is done. He forgets to mention that the ulcer remains and about half the number only would be distal to the gastro-enterostomy stoma, but he does say emphatically that even after successful operation permanent care of diet is essential.

A very interesting point is that the author repeatedly insists that the appendix is the most frequent cause of trouble, both in setting up indigestion reflexly and as the focus causing ulcer. This point and the plea he makes for the more common use of gastric analysis are the most interesting features of the book.

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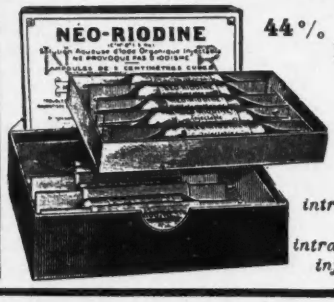

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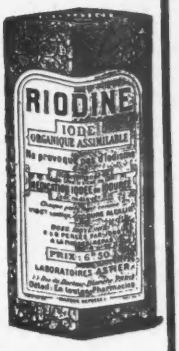

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The book is not of any special importance but is a sound clinical lecture, by one who is evidently a very observant surgeon of considerable experience.

R. H. M. HARDISTY

Treatment of Diabetes Mellitus. Elliott P. Joslin, M.D., M.A., Clinical Professor of Medicine, Harvard Medical School. Fourth edition. 1006 pages, illustrated. Price $9.00 net. Lea & Febiger, Philadelphia, 1928.

Joy is seldom the keynote of a medical book, but in his fourth edition, Joslin holds out more hope for the prolonging of life to the diabetic than can be given to the average man.

Interspersed through the facts and figures relating to his six thousand or so cases are such aphorisms as the following, "Insulin is a remedy primarily for the wise and not for the foolish, be they patients or doctors." "Everyone knows it requires brains to live long with diabetes, but to use insulin successfully requires more brains;" "Arteriosclerosis in the future, and not coma, is the challenge which the doctor must meet." "The treatment of diabetes has not been simplified by insulin, it has been made more complex. . . . . On account of insulin it is hard to find a diabetic who looks severe or whom an audience will believe to be severe." "Is diabetes curable? At present the verdict is: 'Not proven!'" "The clinical evidence of the regeneration of the pancreas is growing." "The progressive doctor makes his patient exercise whether in or out of bed."

His remarks on diet are sensible and practical. "Do not make the fat too high or the carbohydrate too low; strike a balance. Do not treat the diabetic individual like an epileptic on the one hand or like a normal individual on the other. As for protein, use discretion."

The use of synthalin and myrtillin and the feeding of liver are each considered in diabetic treatment.

Diagnosis and prognosis are fully discussed. For the carelessly optimistic, Joslin, has this to say: "I am always slow to tell a patient he does not have diabetes if any doctor has ever found sugar in the urine or thought it present. I tell such patients to have their urine examined each month for a year, and thereafter every six months for life, even though I find no proof of diabetes. ... . .The fairest way in which to determine whether a patient has diabetes is to make the examination without previous notice after a dinner of meat, potato, three slices of bread, and apple pie, with coffee and sugar. The urine should be sugar-free, at one hour, at one hour and a half and two hours after the meal."

The treatment of coma is discussed in forty-one pages. Small doses of insulin at thirty minute intervals are used rather than one massive dose. Surgery and diabetes is considered under several headings with special attention given to the topics of anæsthesia and gangrene.

In the chapter on "Diabetes in Childhood" Joslin says: "At present I believe that the younger a diabetic the greater his expectation of life, but few doctors can live long enough to prove this." "Children make exceptionally good patients."

Joslin's closing words are a challenge: "Almost anybody can get a diabetic patient sugar-free, but the education of the patient to care for himself upon leaving the hospital constitutes more than 90 per cent of the treatment."

LILLIAN A. CHASE

Psychiatry in Industry. V. V. Anderson, M.D., Harper and Brothers, New York, 1929.

That the intellectual and psychological make-up of an individual is of paramount importance to his employer can hardly be doubted. Unquestionably, it transcends in value his physical state. It is generally accepted that an employer has a right, within certain limits, to satisfy himself as to the latter; now Dr. Anderson comes forward with a program regarding the former. This book is not only a book on employment methods it is a book on industrial medicine, industrial psychology, and employment.

The title, "Psychiatry in Industry" is perhaps a little too comprehensive, for the book is really a monograph on the psychiatric activities in the mercantile establishment of R. H. Macy and Company. However, the principles and procedures laid down are undoubtedly applicable to other types of industrial activity, for in any industry there are many misfits; some are trouble makers, others are inefficient, others are frequently absent from work for one cause or another. It is a cardinal principle in American business that once an individual has been trained, he should be retained if at all feasible, for labour turnover is very expensive.

The program of the Department of Medical Research at Macy's is roughly under three heads: (1) The treatment of work failures and so-called problem individuals; (2) The control of employment methods; and (3) Research into methods of selection, readjustment, training, promotion and the like. It may be assumed that with improvement in employment methods work failures will become fewer. Intelligent employment is in this respect preventive psychiatry, therefore.

The treatment of "problem employees" is carried on by continuing the employee at work under a suitable psychiatric régime, or by transferring him to another department, or by laying him off if his case appears hopeless. Employment methods are somewhat different from those usually adopted. For one thing the clerks who do the employing are trained in psychiatric methods. Emphasis is laid on the fact that a large variety of variable factors must be considered before an applicant is accepted or rejected. Not only must education and intelligence be considered but heredity and environment; physical state and emotional state must also be thought of and assessed. One is impressed by the large number of individuals who must be rejected under such a scheme, for 9 per cent are rejected on physical grounds alone. The technique of preparing an employment program is given in some detail.

Innumerable research "problems" present themselves. There are hundreds of different jobs in the store, each one requiring a different type of individual to do the best work. There is a constant need for persons with executive ability, how these may be selected is a study of some importance. The question of automobile accidents requires study; there is an interesting chapter on this.

Dr. Anderson's activities at Macy's have created wide interest and have undoubtedly impressed the executives of the company. This book is an interesting and very instructive account of these activities. The usual psychiatric lingo is used, but the lay reader will have no difficulty in understanding the subject matter. The theory on which the book is based is sound. Unquestionably, it is worth considerable expense to select individuals who in physique and intellect are suitable for the jobs they are to fill. Whether it is possible to do this fairly is not so certain, but one may hope that well controlled studies, such as are recorded in this book, will do much to place the matter of employment and adjustment on a high plane, fair alike to employer and employee.

FRANK G. PEDLEY

The New-Born Infant. A Manual of Obstetrical Pædiatrics. Emerson L. Stone, M.D. 180 pages. Price $2.00. Lea & Febiger, Philadelphia, 1929.

This little book of 177 pages is the "outgrowth of a short elective course of lectures to the Senior class of the Johns Hopkins Medical School." It covers briefly, but in a surprisingly complete manner, the chief troubles of the newborn infant, one of the few omissions being pyelitis.

The recent work of Ford and Crothers on intracranial and spinal cord injuries receives full attention, with perhaps a little too much detail in the matter of the obstetrical problems involved in the injuries. One might question the statement that "inability to nurse one's baby is exceedingly rare."

The book can be recommended as a useful assistant, not only to the medical student but also to the young practitioner.

L. M. LINDSAY

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